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VOLUME XXIII
NUMBER 1

The American City

NEW YORK
JULY, 1920

City Edition and Town and County Edition of The American City Now Consolidated

The increasing community of interest between cities and the near-by towns and villages has created a desire on the part of very many readers of THE AMERICAN CITY for the information contained in both the City Edition and the Town and County Edition. The result has been a growing demand for one edition of the magazine which will combine the reading matter heretofore published in the two editions.

After careful study of the situation and with due consideration of the wishes of the majority of our readers, it was decided to consolidate the City Edition and the Town and County Edition, beginning with this issue. Subscribers who have heretofore been receiving both editions will receive the same material in the new combined edition, and readers who have been taking only one edition will not only receive the material in which they are especially interested, but will also have available the additional reading matter formerly included in the other edition. The subscription price of the combined editions will be $4.00 per year in the United States, $4.50 to Canada and $5.00 to foreign countries.

The Providence Mosquito Campaign

The Valuable Results of Efficient Organization Methods

By Henry E. Childs
Chief Inspector, Providence, R. I.

THE experience of a seven years' campaign for the extermination of mosquitoes in Providence, R. I., has shown the propriety of using a number of principles and methods that have been outlined in earlier papers, but certain modifications of procedure have proved so valuable that a statement of the Providence methods of solving a rather complex problem will be of value.

Malaria-bearing mosquitoes were responsible for arousing the interest of the Health Department. In 1901 and 1902 the City Bacteriologist, Professor Frederic P. Gorham, and the Superintendent of Public Health, Dr. Charles V. Chapin, made an investigation of breeding-places and experimented a little with oiling.

In 1914 an appropriation was secured for active mosquito control operations. The general policy of oiling all potential breeding-places and of doing a little permanent drainage continued through 1918. The most radical change came in 1919 when it was decided to follow the example of other communities in basing all oiling and drainage operations upon reports of inspectors made at short intervals throughout the season.

The Problem in Providence

The topography of the city is varied. Outcropping rock ridges prevent easy drainage in some places. In glaciated regions the natural drainage systems are blocked. In other portions of the city meandering streams have broad margins of swamp. The situation is further complicated by the fact that just outside of the boundaries of the city on three sides there are very extensive and prolific mosquito hatcheries.

The solution of the problem is three-fold. Permanent improvement was accomplished by ditching, draining and filling. Temporary work consisted of treatment of the natural breeding-places, swamps, pools and margins of streams; of caring for public and private catch-basins; and of elimination of the numerous minor breeding-places in barrels, cans, tree-holes, puddles, gutters, etc. Extension work has been done in two ways: by actual work done by Providence mosquito men outside of the city, and by the stimulation of neighboring communities of the Metropolitan District to do work for themselves in coöperation with Providence. The conduct of the campaign that led to success in inducing independent effort on the part of neighbors makes a fascinating story in itself.

Engineering Projects

The bulk of the drainage operations has rested upon simple principles that are well understood. Very often a short stretch of ditch dug by the oiling gang was sufficient to drain some small swamp or to concentrate the territory to be oiled. At other times coöperation with the sewer department led to the ditching of a larger area, the connection with some open drain, or with a city storm sewer. The straightening of the Moshassouck River aided the mosquito campaign, although it was done under the auspices of the Commission on River Pollution to remove accumulated mud and sewage sludge.

During the past year drainage was done at Pleasant Valley Parkway, Fields Point, on the grounds of the State Home and School, in the rear of the ball park, and in the pond regions just over the line in Cranston. Filling was done at Whipple Street. I wish to speak of the work done at the Cole-Rochambeau woods in 1918 and at the Moshassouck in 1916, because they are typical of different sorts of natural breeding-places.

The Drainage of Pleasant Valley Parkway

The Pleasant Valley Parkway is a small park in one of the better residential portions of the city. Prior to the first mosquito control work, the residents of the district were severely annoyed by insects that had bred there. At the head of the park was a large pool with swampy borders in which mosquitoes bred prolifically. The pest had been kept in check only by continuous supervision and frequent oiling.

A city sewer runs through the parkway. A hundred feet of trench was dug, and 18-inch pipe was laid to the deepest portion of the pond. After the partition was removed, the water ran down to a storm sewer and from there passed underground and out of the way. The pond was entirely emptied of water with the exception of that brought in by a sluggish brook that had fed it. A new course was dug for this brook which took it directly to the sewer without passing through the pond hole. That course was more direct, and a better grade was established so that there was an even and rapid flow of water to the sewer.

LAYING THE PIPE LINE WHICH DRAINED THE PLEASANT VALLEY PARKWAY POND, SEEN IN BACKGROUND

Fields Point Salt Marsh Removed

At Fields Point the conditions resembled those of the New Jersey marshes. The low-lying brackish swamp was the one source for the salt marsh mosquito, Aëdes sollicitans, within the city's district. Main ditches were put in which ran direct to the waters of Narragansett Bay. Smaller laterals were added. The standing water was limited entirely to the ditches by this method, and most of the water ran off.

The turf and peat were so soft that it was possible to make use of the New Jersey trick of sawing out the ditches with a hay saw. By the use of this saw it was possible to obtain straight ditches with clean-cut vertical walls. The material could then be lifted out in chunks and the bottom of the ditch leveled so that a direct and smooth flow of water was made possible.

The Whipple Street Pond

This pond lay in a kettle hole in a group of sand moraines. There was no satisfactory manner by which it could be linked up with any running water. In view of the nature of the glacial material deposited about the pool, it was decided to fill it in. Drag shovels were used, and the neighboring hills were cut down and the material dragged inward until the pond had disappeared.

Unfortunately, this method is not applicable in the cases of some others of the ponds because of underlying rock or of dense tree growth.

The Cole-Rochambeau Woods

The woods known as the Cole-Rochambeau woods may be taken as a type of the wooded swamp that is frequently met in and around Providence. Throughout the woods

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The Cole-Rochambeau Woods

The woods known as the Cole-Rochambeau woods may be taken as a type of the wooded swamp that is frequently met in and around Providence. Throughout the woods there were numerous small open pools, most of them shallow but sometimes connected with one another for considerable distances. The trees, bushes and greenbrier were in themselves sufficient to discourage anyone from going very far into the swamp during the wet season of spring. The mosquitoes in there were enough, even in daylight, to worry a bird-lover poking through there after thrushes or warblers. This was just the sort of habitat suited for the early wood mosquito, Aëdes sylvestris.

To keep this region under control meant considerable work. Oil does not spread so readily where there is any underbrush, grass, reeds or débris to catch it. The oiling of these woods was therefore necessarily preceded by considerable clearing away of brush to let the oil spread. Puddling took more than the normal amount of time. A rain might spoil the work almost as soon as the oil had been laboriously spread. As this was situated along a boulevard, it was rather urgent that the swamp be eliminated.

After the oiling gangs had finished their work for the summer they were put to work digging a long ditch lengthwise of the swamp. To this some laterals were afterwards added. A conduit which had carried a brook had caved in and clogged up. At an expense of $240, a drain was lowered so that the water collected in the main ditch could be carried off.

Organization

Mosquito control work is done under the auspices of the Department of Health. The City Bacteriologist, Professor Gorham, is superintendent. He is generally responsible for the entire project. That involves immediate supervision over the laborers, considerable traveling about the city to keep in touch with the progress of the work, the planning of engineering problems, the formulation of the general policy from year to year, and the prosecution of educational publicity.

Inspection was performed in 1919 by a chief inspector and several assistants. There were several part-time inspectors in the spring, seven full-time men in June and July, and but five full-time men later.

Oiling was done by oiling gangs made up as follows: In the spring there were two gangs consisting of a foreman and two laborers each that oiled swamps. Another gang was used for oiling catch-basins alone. Here there were a foreman and four men.

Routine Procedure

All known breeding-places have been listed. A series of "route cards" has been made from them. On each card is a number, a brief description that serves to locate the place, a description of the character of the breeding-spot, and space in which a record can be kept of all inspections, results, recommendations for treatment, dates of treatment, and date of drying-up or of permanent removal of the breeding-place.

The chief inspector has a file of these cards. He issues duplicates of them to his inspectors, who are college students trained in biology. Each inspector is responsible for a given district, for which he holds the route cards, and to which he makes additions if possible. This district is to be covered completely at intervals of eight to ten days throughout the season. At the beginning of the season the inspector brings the route cards up to date by supplying new descriptions of each location. Using a white-lined cup or dipper, he looks for larvae or pupae. He recommends treatment of his places. He is expected to secure samples of larvae, to raise them in the laboratory, and to identify them so far as possible. Furthermore, he is sent out to investigate complaints from residents, hunts for minor breeding-places, and makes collections of adult insects at stated intervals at night. Hobnobbing with residents of his district, he endeavors to map out the distribution of adult mosquitoes and to trace them to their source.

The inspection system has been made the basis for the work in Providence. Daily reports of inspectors are used to plan out the routes of the oiling gangs daily. In the office of the chief inspector is kept a pin map which gives a bird's-eye view of the situation at any time. Different-colored pins are used to show the location of different kinds of larvae, the dates of oiling, and the distribution of adults. Much of the identification and mapping is done at night or on rainy days when field work is impossible.

Technique of Oiling

Each of the swamp gangs of oilers has a machine to carry oil. The oil used is a

A SWAMP IN WEBBING COUNTY AFTER DRAINING

fuel oil from a parafine base. In oiling a swamp the foreman goes ahead carrying a pail of oil and spraying it upon the water by the simple means of a whisk broom. This has been found far more effective and less expensive than the use of special sprays, patent oil-cans or knapsacks. The oil can be flirted to a considerable distance and spread fairly well in this way. It is considered very essential that the sprinkling be followed by thorough puddling of the oil by the two laborers, who carry long-handled brooms for the purpose. This aids in getting an even coating of oil over an open surface, and is especially important when grass, reeds or bushes grow in the water. It is by the puddling action alone that the oil can be brought in between the stems and into the sheltered spots where the larvae are most abundant. Simplicity of apparatus and thorough, conscientious work are the essential factors in oiling.

Kerosene has been used, but it does not spread so well as the fuel oil and evaporates more rapidly. In grassy land it has been found advisable to prepare an emulsion just before applying the oil. It is diluted with an equal quantity of water and shaken thoroughly. The emulsion works down between reeds and grass stems that catch and hold the undiluted oil. The emulsion spreads better than the undiluted oil under any condition. It is planned to cover about 1,200 square feet of water with one gallon of oil, but in tangled undergrowth more oil is required.

The catch-basins are oiled regularly without any inspection. A driver looks after supplies and keeps records. Two men work on each side of the street. One opens covers of catch-basins and throws in some oil from a cup. His partner then puddles this with a long stick. The driver sees to it that all covers are replaced. There are some 6,000 public and over 200 private catch-basins in the city. The oiling gang moves slowly, so that a horse and wagon is found more economical than a machine.

At the end of the day the foreman reports on the time spent, the quantity of oil used, and the localities treated.

OILING GANG AT WORK IN COLE-ROCHAMBEAU WOODS BEFORE DRAINAGE

The Campaign of 1919

The general survey of swamps began March 17 and continued until September 20. Oiling and ditching began April 7. Catch-basins were first treated June 15. In July an intensive campaign was begun to eliminate the minor breeding-places throughout the city.

Early in the season

The Story of the Summit Street Extension, Toledo, Ohio

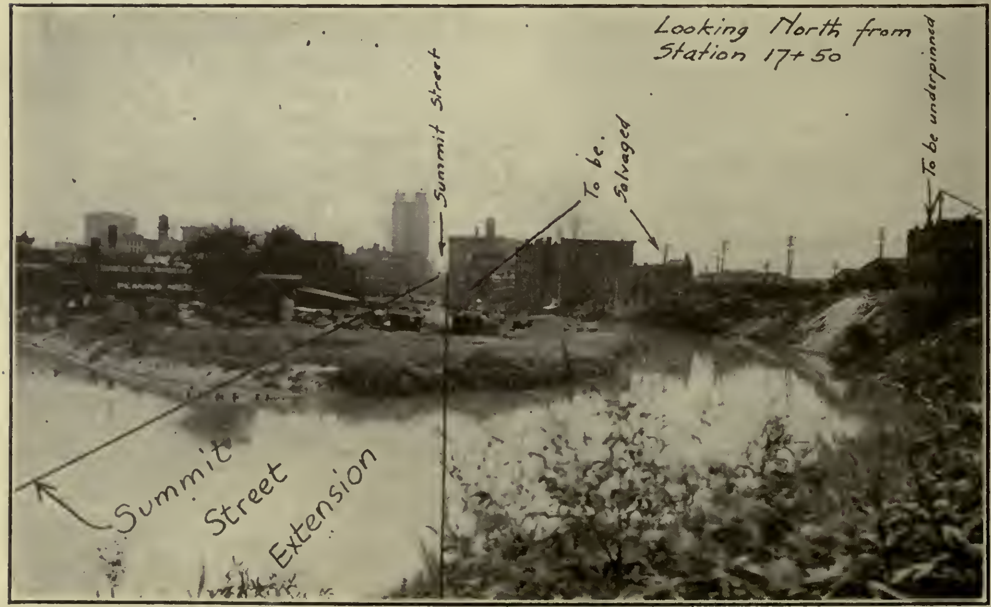
A Revision of Creek Channel and Street Lines Aids Traffic and Increases Value of Extensive Lands

By H. C. McClure
Commissioner of Engineering and Construction, Toledo

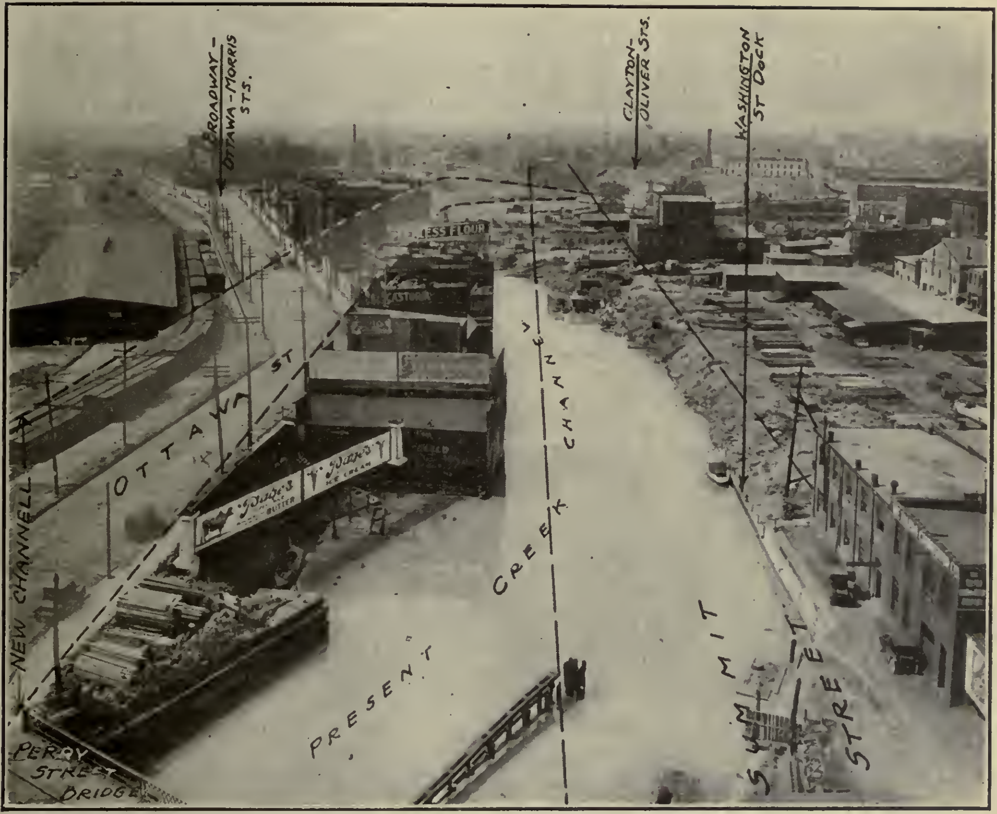
THE average city dweller is apt to give little special attention to the general arrangement of the street system of his city. He uses the streets, as they have been planned or dedicated by numerous persons in the past, with a sense of satisfaction if his way is direct and easy, but with a sense of irritation if direct and easy routes do not prevail.

A city, to develop to its best advantage, must have main arteries for all kinds of traffic leading to all sections. They are valuable for the cheap distribution of all kinds of merchandise, for quick and easy access of people to and from their homes, their places of employment and their places of amusement, for greater speed in fire and police work and in many other ways.

Toledo is unusually fortunate in having certain thoroughfares which are among the city's chief assets and have been important factors in its growth. A serious defect in the system, however, is the separation of the southerly portion of the city from the business district. Summit Street is one of the most important down-town business thoroughfares in Toledo. It is the logical route for an immense amount of traffic of all kinds, because of its location; together with its connections, it parallels the Maumee River for a distance of over 8 miles. A serious handicap to the proper development and the best use of this street has existed in the form of an old creek channel, known as Swan Creek, which in former years served as one of the termini of the Miami & Erie Canal. This creek has cut Summit Street off abruptly within a stone's throw of property worth many thousands of dollars per front foot, and has forced all traffic to seek a roundabout connection between the main business section and the



AN ACTUAL PHOTOGRAPH TAKEN LOOKING NORTH TOWARD SUMMIT STREET, TOLEDO, FROM A POINT WHICH WILL BE ON THAT THOROUGHFARE WHEN IT IS EXTENDED



PHOTOGRAPH SHOWING THE ROUTE OF THE STREET EXTENSION LOOKING SOUTH. THE NEW CHANNEL OF SWAN CREEK IS SHOWN IN PHANTOM AT THE LEFT

Union Station and up-river residential district.

The improvement of this street has been talked of for many years, but until the beginning of 1916 no systematic effort was made to push the improvement to completion. Since the beginning of 1916, the necessary resolution, plans, ordinances, bond issue, property agreements, state legislation, etc., have been completed and the contract awarded.

As the portion of Swan Creek affected was under control of the State Board of Public Works in charge of the state canals, it was necessary to effect the passage of acts by the State Legislature covering the exchange of canal lands. The matter was further complicated by the fact that considerable railroad land was necessary, and proper deeds and papers were required of the United States Railway Administration.

About 40 separate agreements were necessary with private property owners, involving the abandonment and destruction of a number of buildings used by various manufacturing concerns. In all, the legislative steps and the preliminary agreements necessary were unusually complicated and difficult.

Owing to the general nature of the improvement it was first decided to finance the work by a general bond issue. This did not, however, secure the necessary two-thirds vote, and the matter was then taken up by a group of business men, self-styled the Summit Street Extension Association. This group agreed to guarantee 50 per cent of the cost, to be raised as a direct assessment on the property benefited and extending for a distance of approximately one-half mile on Summit Street adjacent. The city's bonds were issued for the remaining 50 per cent.

In the abandonment of various streets and properties necessary in the work, the city will come into possession of approximately 300 feet of property, which is conservatively estimated to be worth at least $200,000.

What the Work Involves

The improvement consists of a relocation of the winding Swan Creek channel and the extension of the existing Summit Street from its present terminus in a straight line to a connection with an important thoroughfare near the Union Station site, known as Broadway. The work requires the removal and proper placing of approximately 130,000 cubic yards of excavation; the construction of a 150-foot section of concrete viaduct across a dead creek channel arm; the construction of a concrete retaining wall up to 45 feet in height, and the installation of two bascule bridges complete, with abutments and operating machinery. One bridge giving a direct connection with the freight terminals of four of the largest railroad systems entering Toledo will be a 40 x 80-inch single-leaf lift bridge, and the other will be a 80 x 80-inch double-leaf lift.

The estimated cost of the work in 1916 was given as $580,000 complete, including property damages. The contract which has just been awarded covers 90 per cent of the construction work, and over two-thirds of the damages have been settled. At present prices it is probable that the work will exceed the 1916 estimate by something like 10 or 15 per cent.

The contractors plan to carry on the work by first making the dry excavation cut by steam shovel, depositing the excavation by trestle work on the street extension without materially closing the present creek channel. They then plan to follow with a wet excavation cut of a channel approximately one-half of the required width, which will allow for an outlet for the creek flow just as soon as this cut is completed. They will then complete the channel cut, using the rest of the earth to fill the present channel. The installation of bridge abutments is to be carried on at the same time, so that the installation of the steel work will proceed just as soon as the street fill has been completed. The installation of the retaining wall and concrete viaduct do not in any way affect the navigation on the creek channel or the flood water flow, and these items are to be carried on independently and at the same time the excavation and bridge work is being done. It is expected that the entire work will be completed this year. It is then planned to install a temporary medina stone pavement on the street extension, to be followed by a permanent pavement as soon as the fill has settled sufficiently.

The improvement when completed will open a direct connection to the Union Station and to a large-growing up-river residential district. It will force a revision of the land values in the vicinity which will add at least one million dollars to the tax duplicate on increased land values alone. The possibilities of the improvement are very marked as the improved section is closely adjacent to the railway freight terminals of five of the largest systems entering Toledo. The property, vacant at present, will become the logical wholesale district. Already plans for two wholesale buildings are under way, and these will doubtless be under construction before the improvement is completed.

The benefits of the improvement will be apparent at such an early date that the long delay in bringing the matter to completion will be the only cause for comment. It is believed that this work stands alone as an improvement of its size which will so nearly finance itself in a very few years from the direct benefits made possible by the improvement itself.

What Is Being Done in Your City to Eliminate Grade Crossings?

It is estimated that there are over 200,000 railroad grade crossings in the United States and that about 2,000 persons are killed annually at these crossings.

In Nebraska there were, January 31, 1917, 6,516 miles of track, or 6,237 miles of operated line, with about 11,300 grade crossings, of which about 5 per cent have some form of protection. This means that in four miles of track there were seven grade crossings.—*Nebraska Department of Public Works, April,* 1920.

Tree Planting Plans for Michigan's Highways

By P. L. Buttrick

Assistant Professor of Forestry, Michigan Agricultural College, Lansing, Mich.

IN the past, American highway engineers have not always realized that a public highway need be anything more than an efficient line of communication. Happily, a somewhat larger conception is beginning to prevail, and attention is being focused upon the esthetic appearance of a road as well as upon its layout and surfacing. This view has been given a great impetus by the thousands of Americans who have returned from France with the memory of her superb tree-lined highways well fixed in their minds. These men realize fully the advantages of the highway beautiful as well as the highway efficient.

The esthetic improvement of a highway of course involves many factors outside the control of the highway engineer. He must confine himself to the right of way. By simple attention to cleaning up the public land on each side of the surfaced road, by taking reasonable care in grading to avoid disagreeable angles, unsightly piles of material, pits and the like, much can be accomplished. The grading and turfing and planting with trees and shrubbery of the unsurfaced portion of the right of way is a more positive measure. On the whole, the most satisfactory effects in planting are obtained from the use of trees. In many parts of Europe systematic tree planting along highways is considered a regular part of highway work.

The Great Opportunity

Actuated both by a wish to make the highways of Michigan attractive and by a full realization of the possibilities of systematic highway planting, the Legislature at its last session passed an act authorizing the State Highway Commissioner to plant shade, ornamental, nut-bearing, or other food-producing trees upon state trunk line highways or other highways within the state upon which state funds have been expended. The State Board of Agriculture is directed by this act to furnish to the Highway Commissioner lists of trees suitable for planting and to furnish planting plans for the work. The State Board of Agriculture, acting as the directing organization of the State Agricultural College, has directed the Forestry Department of the College to prepare such plans for the Highway Commissioner.

The opportunity for presenting a compre-

A WELL-PLANTED HIGHWAY IN MICHIGAN WHICH WILL BE DUPLICATED MANY TIMES OVER UNDER THE NEW PLANTING PLAN hensive plan which shall take into consideration all the forestry, landscape, and engineering features of the subject is great, and the Forestry Department will endeavor to do justice to the large possibilities. Such a plan will go further than simply to decide upon the most economical methods of planting some hardy and fast-growing species of tree which has no other qualifications to recommend it. The latter course would merely fill the letter of the law and add far less to the beauty of the highways than a plan calling for the use of various species of trees according to their practical and esthetic value for certain classes of roads. It is designed to have landscape planting as well as simply tree planting.

Under this law the State Forest Nursery at the Agricultural College and that of the Public Domain Commission, both of which are organized to grow trees for forest planting in the state, are to furnish the Highway Commissioner with the necessary trees, and steps are being taken to produce the large amount of stock which will be required.

In the drawing up of the law the amount to be spent upon this work was left discretionary with the Highway Commissioner, who was heartily in favor of the work. After the law was passed, however, it appeared that under existing conditions of the high cost of labor and materials and the delayed program of construction due to the war, it would be unwise to expend any of the Commission's funds immediately for this work. Accordingly, the next session of the Legislature will be asked to make a separate appropriation for the work if it is still evident that the funds of the Commission are inadequate. Meanwhile the investigation and the organization have gone forward, and perhaps in the end little time will have been lost.

Certain other features of the law became immediately operative. One authorizes villages, townships, cities, and counties to expend money for highway planting. Another permits owners along certain classes of roads to plant trees under accepted plans, and for so doing to receive certain abatements of taxes. Still other provisions strengthen existing laws for the protection of shade trees on public thoroughfares.

Under these laws plus an enlightened public sentiment there is no reason why in a few years the highways of Michigan should not become as famed for their beauty as they are beginning to be for their utility.

Fire Prevention Window-Displays

By William J. Leonard

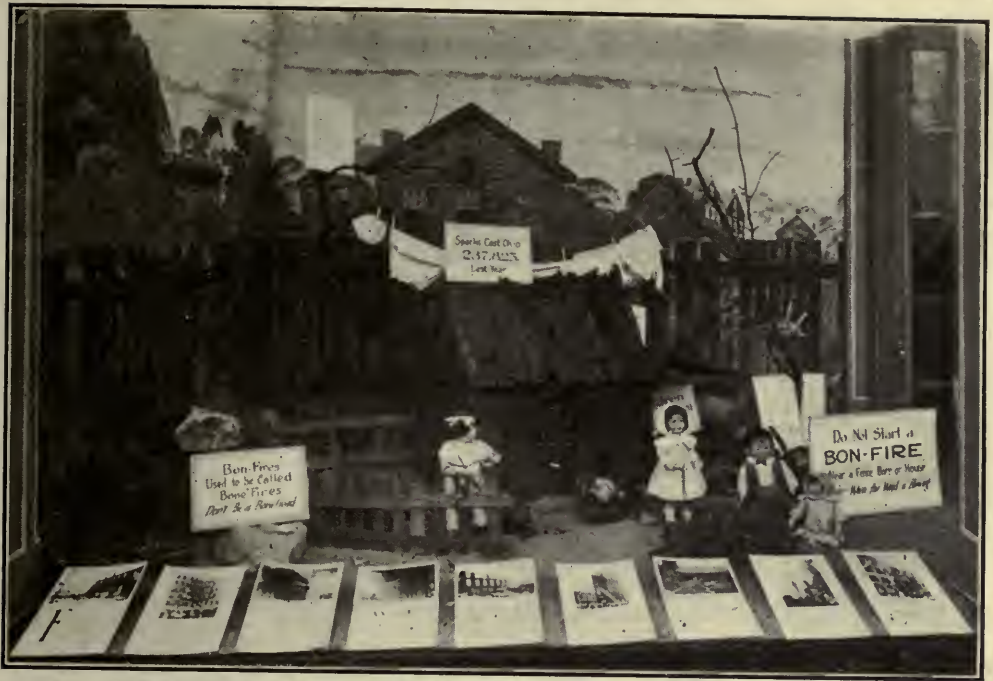
State Fire Marshal of Ohio

NO other feature of the recent clean-up campaign in Ohio's capital attracted so wide attention or engendered such deep thought as the fire prevention windows designed and trimmed by Glenn A. Beall of the Columbus Fire Department. Mr. Beall stuck strictly to the realistic, using in construction actual charred timbers, shingles, etc. The State Fire Marshal's Department, the Fire Department and the Columbus Chamber of Commerce coöperated in the campaign, the Chamber through a powerful Fire Prevention Committee and its auxiliaries.

One window was in a cigar store and was crammed full of half-burned matches (175,000) collected on the streets by the Boy Scouts. This window also bore slogan cards showing the damage done by matches. In order to stimulate interest, a prize was offered for the guess nearest the number of matches actually picked up and displayed.

Twin windows on one side displayed the dangers of the back yard, and here the ingenuity of Fireman Beall was especially brought out. Shingles that had actually been through a Columbus fire were used in "building construction," and dolls represented children playing with fire. Scenery was employed to give perspective. It was a horrible example of a back yard, and typical of hundreds actually in existence all over the country.

The other window depicted a clean house and yard, and in the picture taken of the display, Ohio's Capitol appears reflected by the window. This was not intentional, but it makes a pretty setting—the power of the



ONE OF THE STRIKING WINDOWS IN THE COLUMBUS FIRE PREVENTION DEMONSTRATION, DEPICTING THE POSSIBLE FIRE HAZARDS IN A BACK YARD

state keeping watch and ward over the homes of the commonwealth.

In still another window a littered, rubbish-laden attic was shown, with the question well displayed, "Is *your* attic like this?" The hazards of kitchens were also depicted.

In another window was an old hand fire engine, and cards showing the necessity of rigid inspection and of a fire prevention bureau to be part of the fire department.

All day long and at night, too, crowds stood in front of these displays. They set the Columbus people thinking—especially the information conveyed by neatly lettered cards. The actual losses and the number of fires in the city due to the causes so aptly illustrated drove home to the sightseers the dangers that each second of the day or night confront the householder.

Merchants who were lukewarm at first over letting valuable window space go for such purposes say that never before in the history of their business had they such a run of customers. Others are clamoring for similar displays this fall.

From one prominent corner to another, especially during the busy hours, a complete fire alarm box was moved, and here Fireman Beall gave illustrations of "How to turn in an alarm." In two hours 1,400 alarm box glasses were broken, and 1,400 Columbus people, many of them women and girls, learned by actually turning the trick how to summon the department. A large map of the city, showing the location of the boxes, stood by the alarm stand, and fire alarm cards were passed out with the polite request, "Mark the location and number of *your* alarm station."

Next fall there will probably be one display window for every block in the high-value district.

The Property Loss from Fires

In the United States and Canada we have an average loss of $250,000,000 each year. These are big figures, and, unfortunately, are hard to be taken in—practically $500 a minute. Do you realize what this loss is and means? It exceeds the annual production of gold, silver, copper and petroleum A new fire starts every three minutes. There is a continuous conflagration. Men, women and children are fleeing for their lives before the Fire Fiend!

GETTING READY TO MAKE A FLIGHT FOR AIR SAMPLES IN CONNECTION WITH THE ATMOSPHERIC SURVEY, SALT LAKE CITY

The Salt Lake City Smoke Investigation

A Thorough Coöperative Survey of Causes and Remedial Measures Augurs Well for a Smokeless City

By Osborn Monnett

Consulting Engineer, Chicago, Ill.

DURING the last eight months an atmospheric survey of Salt Lake City, Utah, has been in progress for the purpose of determining the source and cause of smoke and for the working out of a systematic program for reducing it to the minimum.

Salt Lake City is located in the northeastern corner of the Great Salt Lake Valley, and is surrounded on all sides by a fringe of mountains, making the air movements over the city very slight indeed. During the early morning hours the wind direction is from the southwest, which has the effect of blowing all of the smoke into the northeastern part of the valley directly over the city. During the winter months the wind velocity averages not more than six miles per hour, which is not sufficient to carry away the smoke as rapidly as it is formed. During these periods of low wind velocity the accumulation of smoke over the city becomes very objectionable, and radical means are necessary to eliminate it.

Federal Coöperation

The investigation was conducted jointly by the city of Salt Lake, the University of Utah, and the U. S. Bureau of Mines. The engineers in the latter organization directed the work, which consisted of gathering data relating to fuel consumption, smoke density readings, and air filtrations to determine the extent and character of the atmospheric population. The coöperation of the Bureau of Mines was assured through a provision in the General Appropriations bill, by which the Bureau is authorized to extend aid to cities interested in smoke abatement, provided the city will furnish part of the funds necessary for the works. This marks a new era in such work. In the average city smoke abatement has been so bound up with local politics, that very little has been accomplished. It is a hopeful sign that in such strictly technical problems American cities can avail themselves of an independent agency such as a government bureau to work out a solution.

The results of the investigation show that in Salt Lake City large power plants make 40 per cent of the smoke; small heating plants 14 per cent; locomotives 16 per cent; residences 27 per cent; and miscellaneous sources 3 per cent; 510,000 tons of coal are burned in the city annually, and of this amount the residences consume 210,000.

The residence smoke was given special consideration, laboratory experiments being made at the University of Utah on domestic equipment, for the purpose of developing the best methods of firing local coals for smoke elimination. This equipment consisted of cook stoves, heating stoves, hot air furnaces, steam and hot water boilers and other similar types of equipment found in residences. The methods of firing consisted of the coking method, the alternate method, ordinary methods, and methods for starting a fire from the top, that is, throwing the fresh coal on the grate and building the fire on top of the fresh coal. The coal ignites readily and burns without smoke, getting up maximum heat in a shorter time than by the ordinary method.

Extensive experiments were also made looking towards the low-temperature carbonization of coals with consequent recovery of the by-products and the production of a coke which would be ideal for domestic use. Ordinary coke, such as is on the market to-day, is low in volatile matter and is rather difficult to ignite and to control in stoves and heaters. With low-temperature coke, on the other hand, a considerable proportion of volatile matter is left in the coal, ranging from 12 to 15 per cent, making a coke easy to ignite and control in the ordinary furnace. One of the advantages of this system would be the large amount of valuable by-products which would be obtained from the coal and which are now wasted when the coal is burned. This country burns 500,000,000 tons of bituminous coal yearly, and at a conservative estimate an equivalent of 100,000,000 tons of this is wasted in gases and volatile matter containing kerosene and gasoline phenols and valuable organic compounds which can be manufactured into medicines and other useful products. While the low-temperature carbonization of coals is not yet on a commercial basis, there is no doubt that in the near future some system will be worked out for the conservation of the products which are now wasted in our furnace processes.

Air-Planes in Air-Sampling

An interesting phase of the investigation in connection with the atmospheric survey was the use for the first time of airplanes for obtaining samples of air at various levels over the city for analysis. In this connection it was desired to determine what effect, if any, the presence of smelters located in the valley would have on the smoke situation. For this purpose careful chemical analysis was made of the atmosphere throughout the city for the determination of sulphur dioxide gases. These samples were taken at 3,600 feet, 2,200 feet and 1,000 feet above the city as well as on the roofs of buildings and at the street level. Sulphur dioxide down to one-tenth part per million was detected by the methods used. It was found that the sulphur in the atmosphere was no more in

APPEARANCE OF A FILTER USED IN MAKING ANALYSES OF CONTENTS OF THE ATMOSPHERE

The material collected is subjected to chemical and microscopical examination extent than would be expected from the sulphur content of the coal burned in the city, as shown by chemical analysis, and had no effect upon the smoke situation.

Plans for the Future

As a result of the investigation, which extended from the first of September, 1919, to the first of May, 1920, complete recommendations have been made in which a program of attack was laid out for the reduction of all classes of smoke to a minimum. These recommendations embody a smoke ordinance written especially to cover the local situation and an outline of the organization necessary to accomplish the desired results. The plan includes engineering supervision of new furnace equipment as installed; reconstruction of existing furnaces where required; systematic smoke observation and personal instructions to engineers and firemen, as well as a campaign of education among householders in the proper firing of their stoves and furnaces.

It may be said in general that it is possible to burn coal smokelessly in all classes of equipment. From a theoretical standpoint the engineering features have all been worked out. If this were all there is to the problem, it would be an easy matter to abate smoke in any of the soft-coal-burning cities. There is another side, however, to the problem, and that is the psychological side. Cities get just about as much smoke abatement as the public demands, and no more. It requires an aroused public sentiment before much progress can be made. Thus it becomes a question of educating the public in the possibilities of smoke abatement. Once it becomes firmly fixed in the public mind that smoke can be eliminated and a large saving made in fuel at the same time, it will be easy for engineers to work out a solution.

The matter is fundamentally a conservation problem, and it is encouraging to find that government bureaus interested in fuel conservation are empowered to lend aid in such important work.

Financing Preliminary Road Work

Automobile Club and Business Men Underwrite Preliminary Expenses of County Engineer's Office

By S. W. Snively

Managing Editor, Terre Haute Star

UNDER the state laws of Indiana the auditor of a county cannot pay for the preliminary work of the county engineer until the bonds for the road have been sold, as the engineer's pay and that of his men must come out of the proceeds of the bonds. In case of delay in selling the bonds the engineer has had to pay all the expenses out of his own pocket, including the salaries of his assistants, and this he can rightfully refuse to continue to do.

As there were a large number of roads in Vigo County on which estimates were being made, the Terre Haute Automobile Club, through its Board of Governors and President, located a patriotic bank and made arrangements to enable the work to be properly financed and completed. The plan was developed through a conference between the County Engineer and officers of the Automobile Club, and the arrangement has been thoroughly endorsed by business men who have been consulted.

Provision is made for financing the work of the County Engineer and his force by a note negotiated through the Citizens' Trust Company of Terre Haute, thus supplying immediate funds for the survey and for the drafting of plans and specifications for the improvement. The bank is handling the undertaking at a low rate of interest in order to assist in pushing forward work which it realizes is for the benefit of the whole community. It is arranged that the County Engineer take up the note as soon as bonds for the road improvement are sold.

So far as is known, this is the first county that has assumed the public underwriting of road building. It is probable that other counties that have been tied through lack of funds for preliminary work will adopt the same system to insure road improvements.

Board of Arbitrators Sets Purchase Price of Public Utility

By Farley Gannett

Consulting Engineer, Harrisburg, Pa.

AFTER eleven years of struggle between the Schuylkill Haven Gas & Water Company and the borough of Schuylkill Haven, a board of three engineer arbitrators has set the purchase price of the utility company's property, and both sides have agreed thereto. During these years of conflict the courts, the Attorney-General of Pennsylvania and the Public Service Commission of Pennsylvania have all been resorted to, until finally, through the instrumentality of the Commission, a valuation by a board of engineer arbitrators was agreed to, and with one of the engineers of the Commission as chairman, this board made an inventory, investigated the books and accounts, and set the purchase price, which has been accepted by the company and by the Borough Council. The Public Service Commission has still to act on this report and appraisal, but has expressed its willingness to accept it if both sides do so. Thus is ended the eleven-year period of litigation and strife between this utility and the borough which it serves, and another instance is given of the promptness and satisfaction which result from this method of establishing the purchase price of a utility.

As far back as 1909 the borough instituted proceedings before the Attorney-General of the state against the water company to annul its charter, because the company was not supplying a sufficient quantity of water. The case was opened in the Court of Common Pleas in 1910, but before a decision was reached, a compromise was entered into by the two parties, by which the company agreed to get an additional supply of water. This it proceeded to do, but the supply which was obtained proved to be inadequate, and in the meantime, as a Public Service Commission had been established in Pennsylvania under the Act of 1913, the borough entered its complaint before that Commission, and in 1915 the Public Service Commission handed down an order requiring the company to secure an additional water-supply and to build certain pipe lines and other works to improve the service.

The company did not comply with this order, and the Commission later placed a fine upon the company and had numerous hearings to determine why the company had not complied with its order, until finally the agreement for the appointment of an appraisal board to determine the price at which the borough was to purchase the plant was reached in the summer of 1919. The report of the appraisers was handed down in the early part of 1920, setting the price at $175,000, which covered a combined gravity and pumping water-supply, and a gas plant and distributing systems.

As a rule, where difficulties of this sort between utilities and the communities supplied take place and continue, as this one has, over many years, it is found that there is usually some basic cause for the trouble, and this case is not an exception. This little company whose value has been set at $175,000 has against it $200,000 of 5 per cent bonds and $300,000 of stock, which statement is enough to show the reason why the company was not able to give the service and raise the funds therefor that it should; in other words, somebody in the past was too optimistic in placing bonds on this property, and when it came to raising additional funds for improvements and necessary repairs and extensions, the credit of the company was not sufficient to enable it to obtain the required funds, and these improvements and extensions were postponed from year to year, hoping that earnings might improve. It was therefore the burden of this large bond issue and the necessity of paying interest on it that made it impossible to give the service required.

A description of the water and gas plants is not essential to this article, but a brief description brings out to a certain extent the attempts which were made to relieve the situation, although on account of the limited funds these attempts were always insufficient to help materially.

History of the Plants

Originally the town was supplied by water from Panther Creek, a small stream about three miles distant, which gave in the early days an ample supply by gravity. Later, when the summer flow became too small to supply the needs of the town, wells were drilled near this dam and pumped by compressed air. Still later, when the courts ordered additional water to be obtained, a pumping station was built on Panther Creek nearer the town, but the Health Department refused to allow this water to be used unless it was purified, and this pumping station was therefore abandoned. Still later a pipe line was run from the Panther Creek reservoir about two miles to Hummel's Run, and through this a small stream was deflected and carried to the Panther Creek reservoir. This proved insufficient almost immediately, and a little pumping station was put on Hummel's Run to pick up the water which collected below the intake for the pipe line above mentioned, and to pump it back to the intake, from which it was transported to the Panther Creek reservoir. This, however, has also proved insufficient; and as the company cannot raise additional funds for further work, except of a most minor character, the only thing left was for the borough to take over the property and use its credit to properly improve the water-supply.

The laws of Pennsylvania provide two ways by which boroughs can take over water-works properties from companies: (1) under the Act of 1874, which provided that the boroughs shall pay the costs of works plus the cost of maintenance, plus the cost of extensions, plus 10 per cent for dividends on the above, less the amount of dividends which have been paid; and (2) under the Act of 1907, and as later amended in 1913, by the appointment of three arbitrators who are to set the value of property subject to review by the courts.

Since 1913, however, the Public Service Commission of Pennsylvania has had to pass upon all such purchases, so that it is customary to start these proceedings under the jurisdiction of the Commission, which takes the testimony and sets the purchase price. In order to obviate the necessity of presenting evidence as to cost and value, and to cut down the time and expense necessary by this procedure, it was agreed by the two parties at interest that each should select an engineer, and that the Commission should select an engineer, and that these three should set the purchase price of the property, subject to the approval of the Commission.

The water company selected as its engineer C. A. S. Sinclair, of Washington, D. C., the borough selected the writer, and the Commission selected its Assistant Chief Engineer, H. E. Ehlers. This board made a detailed inventory of the property, and made two cost estimates, one by reproduction cost using average prices as of the five-year period 1913-1917 inclusive, and the other an historic cost based on the same inventory, using prices as of the time when each piece of work was constructed.

The books of the company were examined in order to determine whether it was possible to make a book cost, but on account of their incompleteness this was found impossible, as there were no books covering the first twenty or twenty-five years. The income and expense accounts were carefully studied, and a statement of the value of the property, based on net earnings, was made up. These were all set forth in the report which was submitted to the parties at interest, and to the Public Service Commission, as it was on the basis of these indications of value that the board reached its determination as to the selling price. The board also accompanied this report with a detailed inventory of the property, in order that the purchasers might check this up at the time the transfer was made and have a complete record of the property with which to open its books.

Reproduction Cost—Five-Year Average

The reproduction cost on the basis of the five-year average prices, 1913-1917 inclusive, for the water department was found to be $156,398, and the accrued depreciation by the 4 per cent sinking fund method amounted to $21,693, or 15.6 per cent, leaving the cost, less depreciation, $134,705. The reproduction cost, on the same basis, of the gas department was found to be $56,009, the accrued depreciation $15,958, and the remaining cost, less depreciation, $40,051. The depreciation was computed largely on the sinking fund basis above mentioned, but on many items actual observed depreciation was employed, and the actual market price of certain unused equipment was used as a depreciated value.

Historic Cost

The historic cost was built up on the same inventory as the reproduction cost, and where possible, especially with respect to the more recent items, the actual cost as shown by the books was used. The earlier items of property, however, were estimated on the basis of prevailing prices at the time the work was done. The historic cost of the water department was determined to be $134,821, the depreciated cost $116,295. The historic cost of the gas department was found to be $45,027, and the depreciated cost $32,350. The total of the gas and water departments on the historic cost basis depreciated is $148,645. The above facts are summarized in Table No. 1.

TABLE NO. 1

Five-Year Average	Cost New	Accrued Depreciation	Cost Less Depreciation
Reproduction Estimate—			
Water Department	$156,398.00	$21,693.00	$134,705.00
Gas Department	56,009.00	15,958.00	40,051.00
Total	$212,407.00	$37,651.00	$174,756.00
Original Cost Estimate—			
Water Department	$134,821.00	$18,526.00	$116,295.00
Gas Department	45,027.00	12,677.00	32,350.00
Total	$179,848.00	$31,203.00	$148,645.00

Value of Property Based on the Earning Power

A third indication of value was determined upon the average net earnings of the company over a period of ten years from 1909 to 1918 inclusive, as shown in Table No. 2, which shows that the net income averaged over that period was $10,088, having reached a maximum in 1916 of nearly $12,000 and a minimum in 1918 of $7,255.

TABLE NO. 2

Year	Total Gross Revenue	Operating Expenses	Net Income (No Depreciation or Interest Deducted)
1909.........	$20,964.15	$11,637.82	$ 9,326.33
1910.........	20,481.23	12,482.83	7,998.40
1911.........	21,545.64	8,820.43	12,725.21
1912.........	18,513.86	8,916.55	9,597.31
1913.........	18,722.23	8,143.63	10,578.60
1914.........	19,152.87	9,076.27	10,076.60
1915.........	18,922.63	7,580.30	11,342.33
1916.........	20,728.58	8,846.55	11,882.03
1917.........	21,088.92	10,987.69	10,101.23
1918.........	20,467.08	13,311.54	7,255.54
Average....	$20,058.72	$9,970.36	$10,088.36

Neither the reproduction nor the historic costs above determined include items for going value or for water rights, except such amounts as had been actually expended for water rights and damages. In other words, there had been no allowance made up to this point for the fact that the property was a going concern with established business and revenues coming in, or for the fact that the company had ownership and rights upon streams of water, which, although not ample for the supply of the town, were nevertheless useful and to a certain extent valuable in that service, probably to a greater extent than the small amounts of money paid for these rights.

Purchase Price

The board then had before it these facts: that, exclusive of going value and water rights, the reproduction, less depreciation, was $174,756, that the historic cost, less depreciation, was $148,645, and that the property under average conditions could earn about $10,000 per year over and above operating expenses at the prevailing rates. From these premises the board determined that a fair price for the borough to pay and a fair amount for the company to receive would be $175,000.

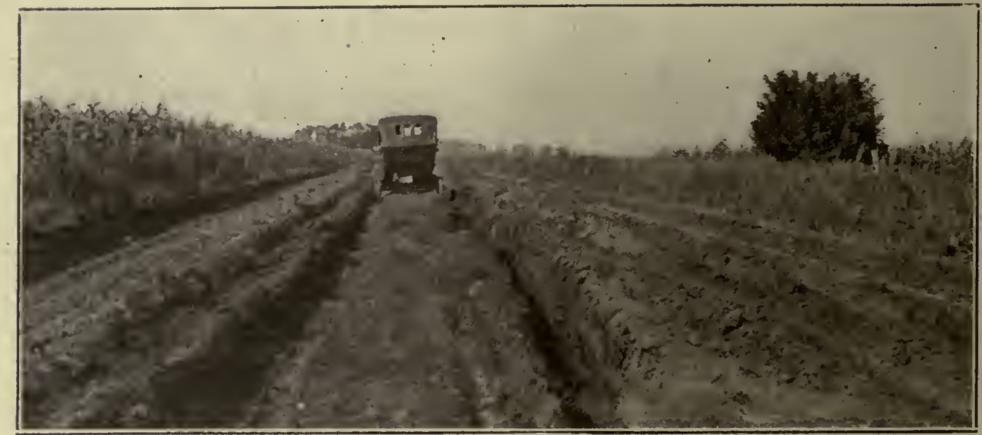
It still remains for the borough to vote on the issue of bonds and for the Public Service Commission to approve the findings of the board of arbitrators.

Looking at this decision from the standpoint of the company, it will appear that there will be no equity for the stockholders, and the bondholders will have to accept a discount on their 5 per cent bonds, but they are getting rid of a property on which they would have to raise additional funds, with not much likelihood of greatly increased earnings, and a property which has caused them endless trouble and little profit. From the standpoint of the borough it is purchasing a property at practically pre-war prices, which, however, has to have considerable money spent on it at present prices to put it in shape to afford the service which is required. The borough is paying for this property in 5 per cent bonds on the water plant, and is being relieved of further litigation, which has not only been costly but has also been most disturbing to the citizens and officials.

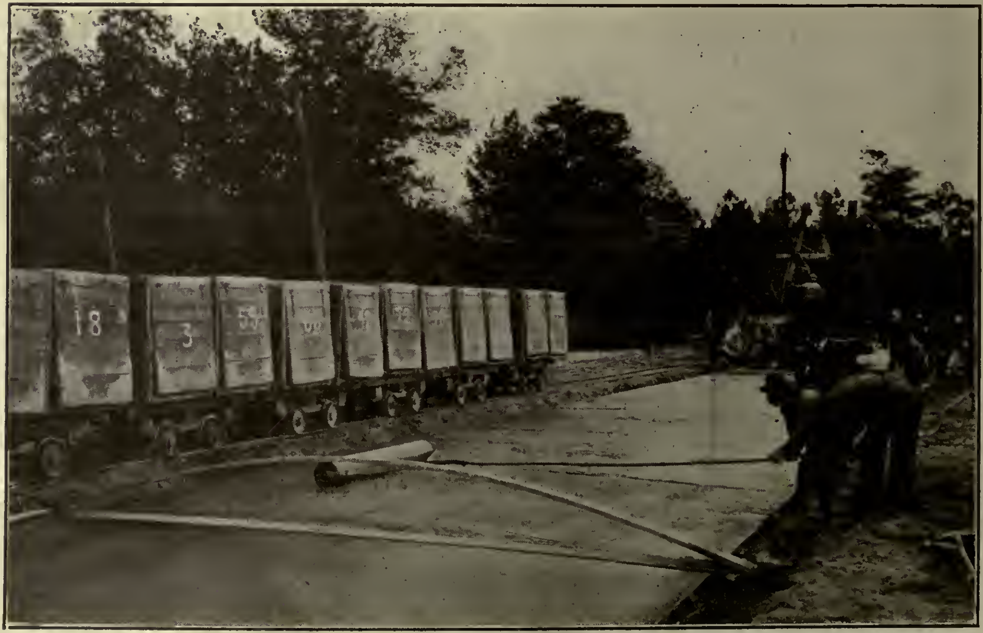
The total cost of the appraisal and report of the board of arbitrators, which was divided equally between the company and the borough, amounted to less than 2 per cent of the value of the property.

A Contrast in Roads

Improved Surfaces are Necessary to Withstand Modern Traffic



THE EFFECTS OF HEAVY MOTOR TRUCK TRAFFIC ON UNIMPROVED HIGHWAYS



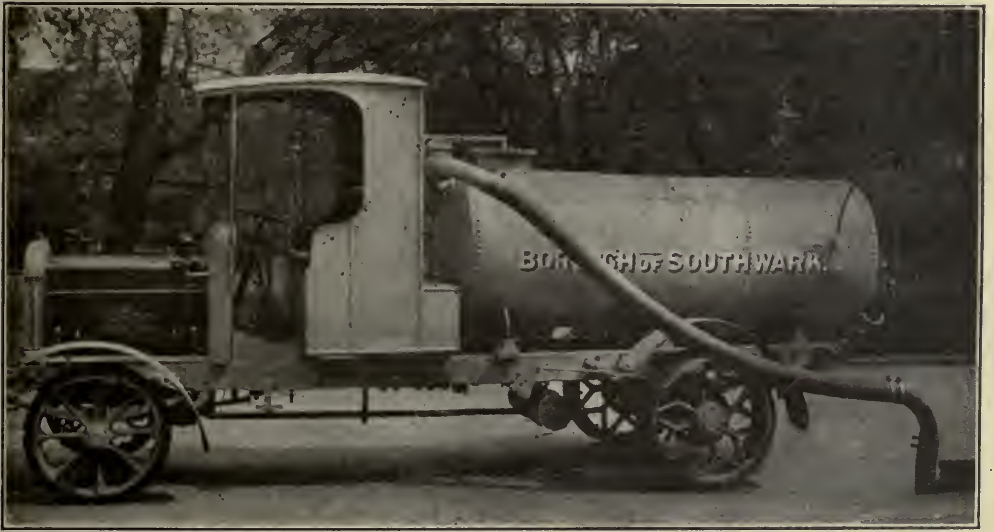
IMPROVING THE LAUREL-DELMAR ROAD, DELAWARE, WITH CONCRETE PAVING

The Labor- and Money-Saving Devices of a London Borough

By Hon. G. A. Isaacs
Mayor, Southwark, London, England

THE Metropolitan Borough of Southwark covers an area of 1,165 acres in one of the most densely populated parts of London. The Borough Council has always shown a desire to be in the van of municipal progress, and has been ready to make use of up-to-date appliances for the efficient operation of the Works Department. In many respects Southwark has been a pioneer in municipal enterprise, and the following description of some of the borough machines may be of interest.

The Borough Engineer, Arthur Harrison, M. Inst. C. C., has been greatly interested in the design and construction of these labor-saving machines. In view of the fact that the machines were purchased either before or during the war, prices have been intentionally omitted, as they would prove misleading and be of little value at the present time.



THE TYPE OF 40-H. P., 5-TON CATCH-BASIN EMPTYING MACHINE USED BY THE METROPOLITAN BOROUGH OF SOUTHWARK, LONDON, ENGLAND

Plant for Crushing House Refuse

For many a year one of the problems exercising the minds of responsible officials has been the satisfactory disposal of house and trade refuse from the great cities. In crowded centers, and particularly in the Metropolis, the question has always been a most pressing one as to the best method to adopt for clearing refuse away quickly and out of sight.

Certain London boroughs own or rent riverside wharves, and the daily collection is shot into barges which are towed down to the mouth of the river. Other authorities send their refuse away by rail to a dump about 20 miles out in the country. Others have erected destructor plants at considerable cost for the purpose of burning the refuse, but this method, even though reducing its bulk, leaves a clinker residue not easy to dispose of in London.

Southwark led the way in the adoption of an entirely new method, viz., that of pulverizing the refuse into a material resembling mold, which obtained a ready sale to farmers for use on the land. The plant consists of four rotary crushers, manufactured by the Patent Lightning Crusher Company, Ltd., each crusher being driven by a 40-B.h.p. motor running at 650 revolutions per minute, geared so as to produce 1,200 revolutions on each crusher. Two of the machines were erected in 1906 and two in 1908, and although they are situated in a closely populated district, there is no nuisance from smell, dust or noise.

The loads of refuse brought to the depot are shot in front of the machines, and in the process of feeding the crushers the men throw out tins, iron, large rags, mats, oilcloth, baskets, boots and bottles. The metals and other saleable materials are sold, and the waste is burnt in a furnace. The refuse passing through the crusher falls onto conveyors discharging into railway trucks, and so on to its destination. Chemical analyses show that the material is a good fertilizer, and is a very suitable dressing for the land, especially on stiff and clay soils.

During the year ended March 31, 1920, no less than 16,491 tons passed through the machines, and this was all sold. Additional plant is now being laid down to deal with the remainder of the refuse collected, as no difficulty is likely to be experienced in effecting a ready sale.

Wood Paving Block Renovating Machine

In 1910 a local firm of engineers—J. Phillips & Company—erected a machine, the first of its kind, for the Southwark Council to facilitate the re-use of wood paving blocks which in the course of years had become worn and uneven on the surface.

By this process the slow and costly hand methods hitherto employed for cleaning and trimming the old blocks are practically dispensed with. Under the old system of handling, a large percentage of the used blocks were either destroyed or discarded as useless. There is little waste by using this process; the blocks, after serving their first term of years, are taken up, cleaned, trimmed and sawed to the required thickness at a fraction of the cost of new ones, and relaid for a further long period of service.

Before they are ready for the saw it is necessary in the case of cement grouted blocks to remove the hard coating adhering to the sides, extract nails and pieces of metal embedded in the wood, and to remove the burred edges. This is done rapidly, effectively and cheaply by an ingenious arrangement of steel pins revolving at a high speed. Pitch grouted blocks are passed through a tank of hot water, and easily cleaned with a scraper. This having been done, the blocks automatically pass on to the saw and are reduced to the required gauge.

The life of wood paving is therefore extended over an increased number of years at a trifling cost, and both in regard to efficiency and economy this machine does all that is claimed for it. It is not complicated in construction, its details and working parts are readily mastered, and it is easily kept in order.

Motor Catch-Basin Emptying Wagon

That the old method of emptying street catch-basin by manual labor, horses and vans is out of date has been demonstrated by Southwark, which in 1913 secured for this purpose from Straker-Squire, Ltd., a motor wagon worked on the vacuum principle.

The motor is one of 40 h.p. and is mounted on a standard chassis with a cylindrical tank, there being also attached a vacuum pump driven through a clutch by the motor. This pump exhausts the air from the reservoir, creating a vacuum of about 12 pounds below atmospheric pressure. To the tank is fitted a 5-inch sluice valve with sufficient hose of 5-inch section to reach the bottom of any ordinary catch-basin. The pump may be worked while the car is running, and when sufficient vacuum is created—usually a matter of some 10 or 15 minutes—the suction hose is let down into the gully and the sluice valve opened, which immediately causes the sludge to rise in the pipe into the tank.

In practice it is found advisable to first stir up the solids in the bottom of each catch-basin, this being done by one of the men attending the machine. The capacity of the tank is about 4 tons [of 2,240 pounds—*Ed.*], and when it is full a float automatically shuts down a valve, thus preventing the sludge from rising above the safe level in the tank. An indicator is also fitted, from which can be ascertained the level of the sludge as it rises. The emptying of the tank is effected by opening a 12-inch hinged door at the back, normally closed by a screw dog on rubber facing, which makes an effectual air-tight joint.

Experience proves that the cost of running this machine works out at 20 per cent less than the cost of the old method, besides the obvious advantage of having the work done in a more cleanly manner, more expeditiously and with considerably less inconvenience to the public.

Street Washing Motor

The Southwark Council also possesses three 45-h.p. motor street washers, which are doing excellent work, purchased in 1916 and 1917 from Straker-Squire, Ltd.

In this street washer a rectangular tank, having a capacity of 800 gallons, is mounted upon a standard chassis. Two distributing pipes run from this tank to the front of the motor, and a centrifugal pump, worked from the engine, forces the water through the pipes at a high pressure, thus effectively washing the surface of the paving. Underneath the tank is attached a set of three 30-inch lengths of rubber on the squeegee principle, which further assists the work, and this is raised or lowered by a lever as desired.

The machine is alternately used during dry weather for watering gutters only, when no pressure is required, the water being simply carried through a third pipe directly below the tank, distributing it about a foot or so from the curb.

One result of the use of this type of machine, taken in conjunction with the fact that many macadam roads have in recent years been converted to wood block, asphalt or concrete, is that the amount of refuse collected has fallen very considerably. Admittedly the consumption of water has increased, but from the public health standpoint any effort towards cleaner streets is a step in the right direction.

Sand and Ballast Washing Machine

Southwark claims to be among the first in the Metropolis in setting out upon a large scheme of post-war road improvement works, and so absorbing a big percentage of local men of the laboring class demobilized from the British Expeditionary Forces. In this connection it is worthy of mention that some 250 ex-service men have found employment in this way, and to this day the Council has succeeded in providing continuous work for the majority of these men.

The importance of securing sufficient material for such extensive works is obvious, but very soon it was found that ballast did not arrive fast enough to keep the work going; hence the necessity for finding some satisfactory substitute.

In the past the crust of macadam roads had been regarded as only fit to discard at the dump, to which it was conveyed by rail some 20 miles out of London. Why not salvage the best of this excavation and convert a waste material into something useable for concrete foundations? A portable machine, adapted to meet the requirements, was accordingly obtained from W. H. Baxter, Ltd., of Leeds, and soon demonstrated its usefulness.

The construction of the machine is fairly simple. A cylinder measuring 16 feet long by 3 feet diameter is mounted on wheels at an angle of 15°, to the interior of which a spiral T iron is fixed. Power to drive this cylinder is supplied by a small petrol engine fitted to the same undercarriage. The cylinder revolves at a steady rate, while a length of 1½-inch hose connected from the nearest street hydrant to the upper end of the cylinder provides a constant flow of water. The excavation is fed into the lower end of the machine, and the rotary motion of the cylinder tumbles the material and conveys it through until it is deposited at the top end washed clean and ready for concrete making. Simultaneously a series of varying screens separates the material into three gauges, all of which in turn are used with distinctly satisfactory results. The residue—a low percentage—is used for mortar making.

The machine is moved from one job to another as occasion demands. Cartage of excavation to depot and railway charges are saved, likewise the purchase of ballast and cartage to job.

The machine has more than justified its selection, so much so that another was placed on order some months ago and is daily expected to arrive, when it will immediately be put to use.

Maintenance of Stone and Gravel Roads

By Wm. Watters

Road Superintendent of Lanark County, Ontario, Canada

As the ever-increasing motor traffic makes it imperative that road engineers be prepared to meet constantly changing conditions, the writer believes it is well to have one foreman or overseer to look after from four to five miles of roads at all times, and in addition to this, a "traveling patrol" consisting of two men and teams furnished with the necessary tools, such as grader and plow and wagon, to work in conjunction with the local foremen. Wherever there is ample stone and gravel for these men to work with, good results are obtained. Considerable money has been spent on maintenance, and it is believed that the Department was well advised when it decided to make the grant for maintenance equal to that for construction. Since 1900, we have spent on maintenance the sum of $112,210.95, of which $35,459.21 was spent in 1919—more than double the amount spent in 1918.

To keep the roads in prime condition, the graders should be put into service just as soon as the frost has gone out enough in the spring. Turn the shoulders out first, then reverse, and if possible bring enough material in to the crown so that the water cannot lie in it, and under such conditions the road will stay fairly good most of the season. The writer believes that the ordinary water-bound macadam or gravel road will not stand up without some surface treatment such as Tarvia or asphalt.

With regard to the maintenance of the leading or provincial county roads, it is felt that methods of construction will have to be changed so that maintenance can be much longer deferred than at present. The motto "Build your maintenance into your construction" is a good one. In this way, by starting with good drainage, with a proper grade and well-built foundations, and finishing the road with some reliable bituminous binder by the penetration method, expensive maintenance will be largely overcome. Lanark County is going to start building along these lines with every confidence of success, and will patrol the roads just as soon as enough broken stone and gravel can be secured and laid down in stock piles with a medium-sized truck, so that maintenance throughout the county can be expected.

How the National Menace of Underpaid Teachers Is Being Faced

The national menace which has appeared as a result of changing economic conditions, in the form of a shortage of teachers in the public schools, is actually more dangerous than adult illiteracy or the un-Americanized foreign-born element, however serious and threatening these problems may be. The shortage of teachers has already added more than half a million to the army of children who are without any school advantages whatever, and unless its influence is checked it will in a few years result in a crop of illiterates many times greater than was revealed by the war in 1918.

But this condition will be corrected. The public in some of the more progressive communities has already responded to the need of doubling the pay of teachers. For every one of these communities, however, there are scores of places where the public has not yet awakened to the seriousness of the situation, and these are the places which must be reached with adequate information as rapidly as possible.

It should be considered the duty of every teacher and every citizen interested in the welfare of the schools to assist in placing before the public the dangers which actually threaten the efficiency of the public schools. It is also suggested that teachers and citizens ask the local press to make use of the information given in the table on page 25, so as to get before the people what has actually been done in some places to increase the salaries of teachers.

		Elementary Teachers		High School Teachers	
		1919	1920	1919	1920
Adams	Minimum	650	850	850	1000
Mass.	Maximum	800	1200	1000	1400
Adrian	Minimum	650	950	800	1150
Michigan	Maximum	800	1100	1800	2050
Beaumont	Minimum	540	750	720	950
Texas	Maximum	945	1050	1350	1900
Bellingham	Minimum	650	840	960	1140
Wash.	Maximum	1020	1260	1440	1680
Berkeley	Minimum	900	1200	1380	1680
Calif.	Maximum	1320	1620	1620	1920
Berlin	Minimum	600	900	650	1000
N. Hamp.	Maximum	1000	1300	1600	2050
Bluefield	Minimum	675	765	810	855
W. Va.	Maximum	765	810	1100	1200
Cen'l Falls	Minimum	580	900	980	1380
R. I.	Maximum	800	1300	1100	1540
Cleveland	Minimum	700	1030	100	1300
Ohio	Maximum	1400	1725	2500	2760
Coffeyville	Minimum	698	720	900	990
Kansas	Maximum	810	810	1035	1494
Columbus	Minimum	750	1000	900	1125
Ohio	Maximum	1200	1600	1800	2250
Cumb'rl'd	Minimum	600	600	750	750
Md.	Maximum	850	850	1000	1000
DesMoines	Minimum	750	1180	950	1250
Iowa	Maximum	1200	1505	1550	1940
Dubuque	Minimum	600	800	850	1000
Iowa	Maximum	900	1200	1250	1550
E. Aurora	Minimum	550	750	950	1150
Illinois	Maximum	1050	1250	1800	2000
E. St.Louis	Minimum	550	800	750	1000
Illinois	Maximum	1100	1550	1900	2450
Eau Claire	Minimum	495	765	765	990
Wisconsin	Maximum	675	810	1440	1600
El Paso	Minimum	540	900	900	1100
Texas	Maximum	1000	1200	1600	1800
Evansville	Minimum	600	700	900	1000
Indiana	Maximum	950	1100	1650	1800
Fargo	Minimum	675	945	990	1170
N. Dak.	Maximum	810	1080	1080	1530
Fitchburg	Minimum	600	1050	750	1200
Mass.	Maximum	900	1650	1100	2450
Hamilton	Minimum	475	700	800	1200
Ohio	Maximum	950	1500	1800	2100
Hatt'sburg	Minimum	540	630	720	900
Miss.	Maximum	870	1000	1350	1500
Henderson	Minimum	468	468	800	800
Kentucky	Maximum	716	716	1250	1350
Holland	Minimum	650	1000	675	1000
Michigan	Maximum	775	1000	1200	1400
Joplin	Minimum	450	540	765	855
Missouri	Maximum	653	810	1170	1350
Kans. City	Minimum	750	925	1000	1200
Missouri	Maximum	1250	1350	2050	2350
Lansing	Minimum	600	800	800	1000
Michigan	Maximum	850	1050	1700	1950
Lawrence	Minimum	675	900	900	1000
Kansas	Maximum	1200	1400	1250	1500
Lincoln	Minimum	750	1000	900	1000
Nebraska	Maximum	1250	2200	1550	2200
Madison	Minimum	750	950	1050	1200
Wisconsin	Maximum	900	1100	2100	2100
Monessen	Minimum	585	738	945	1080
Pa.	Maximum	972	1170	1530	1764
Montclair	Minimum	900	1050	1150	1500
N. J.	Maximum	1125	1550	2500	2900
Muskogee	Minimum	540	810	810	900
Okla.	Maximum	855	1080	1080	1350
Nashua	Minimum	650	900	900	1200
N. H.	Maximum	900	1200	1100	1400
Newark	Minimum	700	900	1000	1000
N. J.	Maximum	1200	1500	2700	2800
New B'df'd	Minimum	750	1000	1000	1200
Mass.	Maximum	1000	1350	1900	2375
Newport News					
	Minimum	576	1100	697	1400
Virginia	Maximum	616	1600	819	2000
Okla. City	Minimum	760	760	1200	1200
Okla.	Maximum	1140	1140	1800	1800
Paducah	Minimum	450	540	675	855
Kentucky	Maximum	585	720	1125	1350
Park'sburg	Minimum	562	675	800	900
W. Va.	Maximum	875	945	1500	1700
Paterson	Minimum	800	1040	1200	1440
N. J.	Maximum	1400	1640	2500	2740
Petersburg	Minimum	600	700	750	850
Virginia	Maximum	900	1050	1800	1950
Plattsburg	Minimum	450	750	800	950
New York	Maximum	600	1150	900	1350
Pottstown	Minimum	470	720	800	1050
Pa.	Maximum	640	800	1500	1800
Saginaw,E.	Minimum	600	925	875	1150
Michigan	Maximum	975	1250	1650	1950
San Jose	Minimum	900	1200	1300	1600
Calif.	Maximum	1260	1560	1600	1900
Sharon	Minimum	495	855	810	1215
Pa.	Maximum	810	1238	1500	1950
South Bend	Minimum	550	800	850	1050
Indiana	Maximum	1150	1400	1800	2000
Sp'tanburg	Minimum	540	720	675	900
S. C.	Maximum	675	1080	1000	1200
Spokane	Minimum	750	850	1100	1150
Wash.	Maximum	1150	1350	1600	1750
Springfield	Minimum	500	800	900	1200
Illinois	Maximum	950	1200	1500	1800
Springfield	Minimum	880	1180	1150	1150
Mass.	Maximum	1050	1350	2800	3100
Stillwater	Minimum	540	720	765	855
Minn.	Maximum	630	783	1098	1530
St. Paul	Minimum	600	600	800	1500
Minn.	Maximum	1000	1500	1600	2100
Tucson	Minimum	810	1080	1150	1300
Arizona	Maximum	990	1080	1650	2000
Utica	Minimum	550	800	800	1000
N. Y.	Maximum	1000	1400	1200	1600
Waycross	Minimum	540	540	810	900
Georgia	Maximum	720	720	1200	1200
White Pl'ns	Minimum	850	1000	1200	1500
N. Y.	Maximum	1125	2000	2200	2800
Wilk'sBarre	Minimum	552	702	660	825
Pa.	Maximum	960	1200	1800	2070

America's Housing Need and How to Meet It

By R. P. Blake

Supervising Engineer, Independence Bureau, Philadelphia

THE housing shortage in America at the present time is so great as to be a national problem of first importance. Such surveys as have been made indicate that before all our people could be properly housed, accommodations for at least one million families would have to be provided.

Confronted with the existing very large and growing housing deficit, handicapped by lack of funds, by shortage of labor, by uncertain and mounting costs, and the necessity of educating the public to accept new cost levels, the ordinary building agencies are utterly unable to meet the need within any reasonable period of time. Conditions appear certain to get worse before they get better, unless vigorous, well-planned community effort on a nation-wide scale is added to the activities of the ordinary building agencies. Otherwise relief is a matter of the indefinitely distant future.

In this discussion we are seeking to answer the question, "What can we do to get houses and get them in a manner which will in the long run prove to be best for the investor, for the purchaser, and for the community at large?"

The Reason for the Shortage

House building started to decline in 1914 and the decline increased as the war progressed, particularly in 1917 on account of our large war program, the shortage of money, the necessity of conserving labor and materials, and the uncertainty of the future. The high cost of building has caused investors to hesitate before placing their money in house-building enterprises. It seems unlikely, however, that building costs can be reduced to any great extent for a number of years. Various factors point to this.

The first of these is the very large housing shortage, which it will certainly take years to meet. Obviously, price reduction cannot be expected as long as demand exceeds supply. Building materials in general can be cheapened only by reduction in labor or transportation costs. Transportation costs seem sure to rise, while labor costs can (short of actual wage reduction) decrease only through increased production per unit of labor. In the face of the world-wide shortage of labor, the high cost of living, and the organization of labor, wage reductions of any magnitude seem out of the question. To increase production per unit of labor either through better methods and equipment or through increasing the efficiency of the worker will obviously take much time. We are therefore forced to the conclusion that we must resolutely and vigorously face the task of meeting our serious housing shortage at present building costs.

Housing a Good Investment

It can readily be shown that house building to-day under correct conditions is a good investment because costs relatively are not abnormally high when compared with incomes and with the purchasing power of the average substantial community. In the large, practically handled, housing development economies of from 10 to 20 per cent can be obtained through quantity purchase, quantity building, organized management, and the most efficient use of labor and materials when compared with the operation of the ordinary builder of moderate capacity. This saving will operate as a safeguard against loss, should building costs be lowered.

But there is danger of serious loss in poorly planned housing. Anyone who has thoughtfully observed the haphazard house building in American cities, whether by the ordinary real estate builder or by industrial corporations, cannot escape the conviction that very great losses have frequently been sustained by the builder or the community or both, through failure to base the operation upon sound and accurate information, to observe proper standards, and to follow the right sort of policies. As instances may be cited the monotonous and frequently squalid housing in the ordinary steel town; the flimsy, box-like shacks of the wildcat builders, and the dark, unlighted, undrained tenements of some of our large cities.

The entering by the community into the business of building houses is a very important step and one which requires careful consideration before decision is made.

The building and sale or rental of houses is one of our oldest and best-established industries. Its maintenance in a sound condition, so that the housing needs of a community will be best met in a reasonable fashion, is of paramount importance. Therefore it is vital that legitimate interests engaged in building houses should be fostered rather than retarded. Since hope of a reasonable return on the investment is what attracts money in any broad activity, it should be evident that under normal conditions housing cannot successfully be put on any other basis than one assuring a reasonable return. On the other hand, it is so very important that a community be adequately housed, that a considerable degree of control over housing must be exercised by the community if serious abuses are to be prevented and its best interests safeguarded.

Any community which does not retain control over the character of its housing is bound to suffer from the varying standards applied by those normally engaged in building. The community upbuilt through the uncoördinated efforts of a large number of builders will be subject to the evils growing out of bad housing. Almost any American city might serve as an illustration of this fact. Striking instances such as Akron, Ohio, and Pittsburgh, Pa., are so well known as to require little comment.

Lack of community supervision often results in greatly inflated values, which work much hardship on the average home buyer. It has been estimated that in Gary, Ind., home buyers lost approximately $10,000,000 from inflation of values in a single decade. A community housing project at Akron, Ohio, finds itself seriously handicapped by the inflation of real estate prices resulting from unchecked land speculation. In the end, the home buyer or home renter of moderate income pays for this inflation.

When the ordinary building agencies cannot meet the housing needs, it is clear that if housing is to be secured it is necessary for the community to find out what is needed and take steps to see that that need is met. This may involve the formation of a community housing development to provide whatever housing the builders cannot supply, or it may mean merely assisting legitimate builders.

Need of Adequate Information and a Definite Program

The factors affecting housing conditions and the remedies necessary are many and varied. Many of the factors are new. If the maximum results are to be had and serious mistakes avoided, action must be based on a thoroughgoing study of conditions, both local and general, and a definite program should be drawn up, with demonstrably sound policies clearly set forth and understood.

The survey as a basis for drawing up a practical program comes first. It will usually cost less than half as much as the cheapest house recommended as a result. The cost of this preliminary work is usually borne by the Chamber of Commerce or other representative body. With the report at hand, the money is generally best raised through a combination of private and semipublic solicitation of the interests suffering from the housing shortage, together with, in some cases, public stock subscriptions through an intensive campaign. The analysis and report must, therefore, be both educative as to the need, and clear and convincing as to the soundness of the investment. Obviously, this means organized sales and publicity effort.

It all comes down to a matter of interesting money hitherto unfamiliar with housing. Anyone with experience in the promotion of new enterprises knows that given a sound project, definite facts, and a demonstrably practical plan promising reasonable returns with small risk, money can be raised. Uninformed enthusiasm or impractical philanthropy will not suffice and are likely to do damage.

Organization of Housing Company

It is best to form an incorporated company with board of directors, executive committee and salaried staff. The staff will vary in size and cost with the scope of the program undertaken. This will involve a considerable overhead charge, but the overhead necessary to insure efficient management will prove to be true economy. Such costs will vary, but an overhead expense for management, supervision, and sales of from 5 to 10 per cent of total construction cost is usually necessary. Architects' services will add from 4 to 6 per cent, but will include supervision of construction and much other service for the higher figure. While these overhead costs may seem high, they will be included in housing obtained through any agency, though they may not be recognized as overhead. All construction should be contracted for, as organizing a construction company for a community housing project would be highly questionable under any circumstances, and usually not to be considered.

Terms of payment should be definitely determined only after finding out what costs will be and what terms the purchasers can best meet. This will be shown from the survey. The purchasing power of the average substantial community, however, is very great, as is being proved in many communities, notably Mansfield and Akron, Ohio, Cumberland and Baltimore, Md., and Philadelphia, Pa. Families must be classified according to income, size and standard of living. The experienced person will then be able to tell very closely how many houses of each type and cost can be sold or rented and on what terms of payment.

Standards of Construction, Design and Appearance

All community housing projects must aim primarily at one thing—providing good houses for sale or for rent on terms which the future owners or tenants can meet without undue hardship. This means that not only must the house be structurally good, so that it will have life, but it must also be practically planned, pleasing in design and appearance, and the surroundings must be good.

Large classes of people who formerly sought little more in a house than shelter and low rent are now demanding and are able to pay a reasonable price for fully modern, well-designed houses. The experience of the last few years indicates that even in very moderate-priced housing anywhere from 25 to 50 per cent of the value depends upon questions of comfort and appearance, and this percentage increases with the standard of living. If standards of design and appearance are too low, the house is likely to be unsalable or unrentable except under pressure of a severe housing shortage.

It is the part of wisdom, therefore, to determine what standards will prove best in the long run and then secure them as economically as possible—but without fail secure them. If they are to be sold the payment terms must then be adjusted to the ability of the purchasers to meet them. If this cannot be done, the project is not a sound one as an investment and must be financed on a semi-philanthropic basis or as a public necessity, if at all.

Selling versus Renting

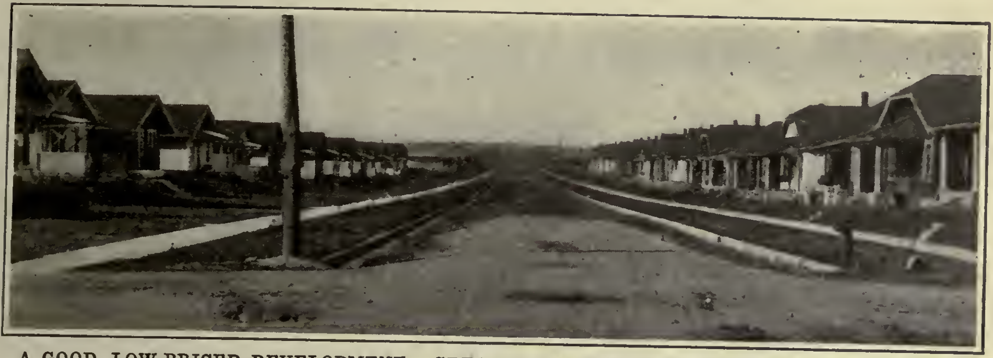
The advantages of home owning both to the individual and to the community are so great, provided good homes at fair prices are obtainable, that wherever possible all efforts should be aimed at sale rather than rental. The home owner has a real stake in the community and will help maintain good standards of community life, while for him home purchase is in the nature of a savings account. Objection has been raised to long-term home-purchase plans on the ground that a man should not spend most of his life paying for a home, but if he pays rent all his life, what has he?

It is undoubtedly a fact that, generally speaking, in the past house rents have not been on a basis yielding a reasonable return on the investment. The investor has looked largely to the appreciation in land values to increase his return. This method is at best a gamble that under present conditions will not attract much capital to the housing field. An analysis of rental and sale charges, as the careful investor will view them, shows approximately:

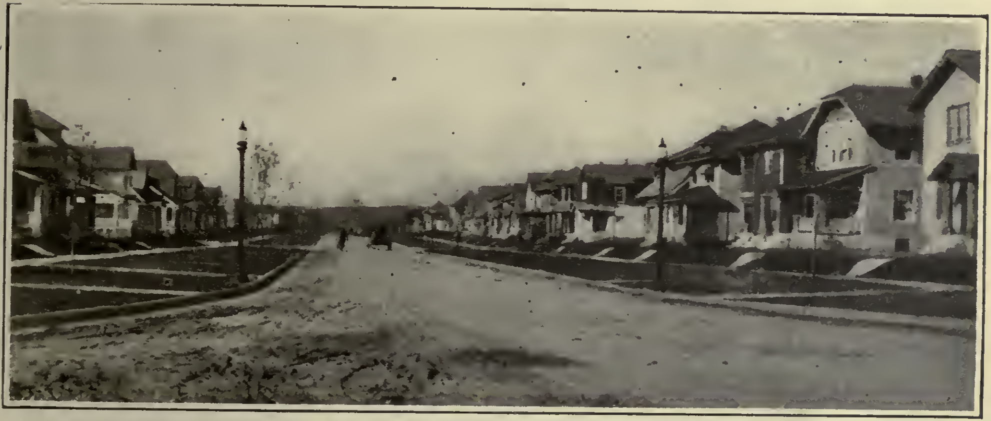
RENTAL CHARGES ANNUALLY PER $1,000 OF INVESTMENT

Interest at 6 per cent	$60.00
Amortization	18.00
Insurance at $2.00	2.00
Taxes at $2.50 on 80 per cent	20.00
Repairs and maintenance	30.00
	$130.00
Assume 2 weeks' vacancy per year	5.25
	$135.25

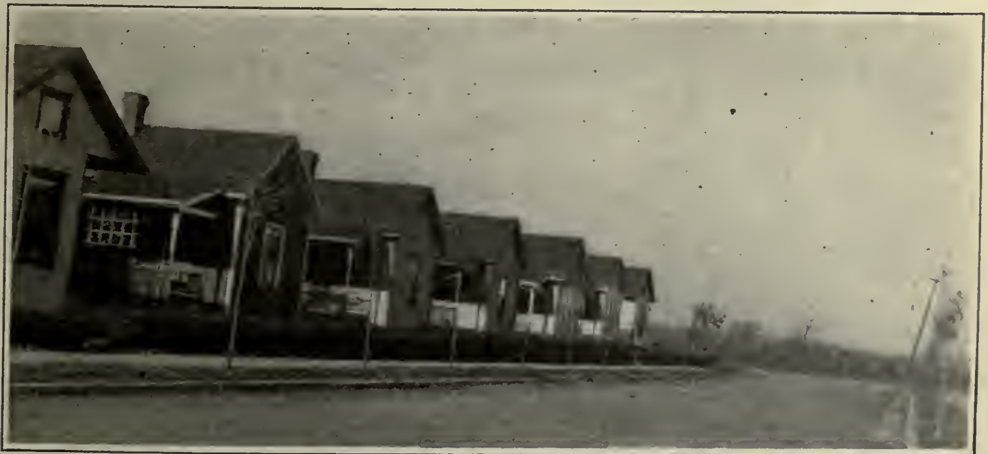
This is approximately $11.30 monthly per $1,000, or $56.50 per $5,000 home. Amortization is estimated on a basis of returning 50 per cent of the investment in 20 years. Repair and maintenance costs are estimated above on the basis of a 6-room modern house costing $5,000, including land. For



A GOOD, LOW-PRICED DEVELOPMENT. GREATER VARIATION IN DESIGN ALONG THE LEFT SIDE OF THE STREET WOULD HAVE EFFECTED CONSIDERABLE IMPROVEMENT



A WELL-PLANNED DEVELOPMENT. SUCH CONSTRUCTION AND ARRANGEMENT MAKE FOR LASTING SATISFACTION AND MAINTENANCE OF VALUES



CHEAP CONSTRUCTION AND MONOTONOUS GROUPING IN AN EXCELLENT LOCATION WHICH MIGHT HAVE BEEN DEVELOPED IN AS SATISFACTORY A MANNER AS THE STREET SHOWN NEXT ABOVE frame construction kept in good repair, these repair costs are low except with very good tenantry, while for brick, stone or good stucco construction lower costs would be the rule for the first ten years.

Sale charges for a similar 6-room house will show:

Assume first mortgage 60 per cent at 6 per cent interest	$3,000
Assume second mortgage 30 per cent at 6 per cent interest	1,500
Cash payment 10 per cent	500
	$5,000

Interest on first mortgage	$180
Interest on second mortgage	90
Payment on second mortgage equal to interest	90
	$360

This means $30 per month to the building or holding company. This will discharge the second mortgage in about 11½ years, and if the same rate of payment were continued it would discharge the first mortgage in a like period. This is the plan widely used in building and loan societies, except that the payments other than interest are used to buy stock in the building and loan company, which, with dividends earned, may shorten the payment period somewhat.

In addition, the home purchaser has the following charges:

Taxes $20 per $1,000	$100.00
Insurance $2.00 per $1,000	10.00
Repairs and maintenance $15 per $1,000	75.00
Total	$185.00
Payments	360.00
Total carrying charges	$545.00
or approximately (monthly)	$45.40

The above repair and maintenance costs are based on the fact that the average home owner of moderate means will do much of this work himself. Obviously, he can neglect amortization. The above comparison forces the conclusion that except under special conditions, as, for instance, where high land values prevent all idea of sale to the individual family, it is better to attempt the construction of housing to be sold rather than to be rented.

Coöperative Community Projects

The garden cities of England, some of which have resulted from truly coöperative community projects with stock ownership in the community company substituted for ownership of the individual house, have attracted much attention, and efforts to introduce the idea in this country have been made. While the plans proposed are extremely promising, it is not through any such departure from existing practice that the necessary amounts of money to relieve the present emergency can be secured. Such coöperative housing may do much in a decade, but the need is upon us and will not wait.

Developments such as those of the Octavia Hill Association, the Girard Estate of Philadelphia, and the Schmidlap project in Cincinnati offer much promise along the lines of rejuvenation of low-grade districts in crowded communities, but they cannot greatly influence at this time the course of new construction, because they do not offer sufficient returns to attract the very large amounts of capital necessary.

The Town Plan

No broad discussion of community housing can well afford to omit reference to the importance of the town plan. Housing and home life, while the major factors in the community, can be dealt with intelligently only if considered in connection with many other things, and therefore any attempt to solve any large housing need as an isolated factor is foredoomed to partial failure.

Town planning is not primarily the special treatment of a group of buildings, the beautifying of a public square, or the creating of some spot of special interest. True enough, these are to be expected in the fulfillment of a well-planned scheme, but they are not basic. Town planning is the careful, thoughtful analysis of all the activities which go to make up a community, and the future caring for these, through a well-defined plan, in such a manner as will allow each to function properly for itself and as a whole. Proper expansion must be controlled and safeguarded through the formation of well-defined zoning and building laws, which must logically form a part of the town plan.

Town planning is a large and important work and of vital interest to our fast-growing cities. That it pays is readily proved by briefly reviewing some of the enormous expenditures of our larger cities, necessitated in street opening, extending and widening, and in our smaller cities, money wasted in relaying work originally not properly conceived; to say nothing, in the cases of both, of the vast amounts lost by reason of property depreciation through uncontrolled and unhealthy expansion.

Forward Steps
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

Public Welfare Departments

Denver's Free Weighing Scales

DENVER, COLO.—So far as this department knows, Denver is the only city in the United States that has established public free weighing scales as a protection to the consumer against profiteering. The Inspection Department of the City and County of Denver, having been called upon frequently to weigh groceries at its headquarters in the City Hall, decided to establish scales near the down-town central district for greater convenience.

These scales, in charge of an attendant, have been in operation since March 27, 1920, the service, of course, being free of charge. During the first thirty days 2,069 packages were weighed, of which only 87 were found to be short in weight. In most instances the packages were short just a few ounces, but there were some exceptions where a shortage of from one-half to one pound was discovered.

Whenever a short weight is discovered, the purchaser is given a certificate stating the actual weight of the package, the nature of the package and the price. The certificate also contains the name of the merchant who sold the package and the name of the purchaser, with their respective addresses. The purchaser then returns the package to the merchant with the slip and receives adjustment. All complaints

WHERE DENVER TEACHES MERCHANTS TO MEND THEIR WEIGHS have been quickly and satisfactorily adjusted.

The attendant at the free weighing scales keeps a record of all packages weighed. Whenever a repetition of short weight is found to have occurred in the same store, an investigation is made by the Chief Inspector. The most important result of the innovation has been that it has served to make merchants more careful in weighing packages and to give the public a feeling of confidence that they are getting fair treatment from the merchants. The scales are open from 9 to 12 A. M. and 1 to 6 P. M. every day, and to 9 P. M. on Saturdays. Any package weighing from one ounce to one hundred pounds is handled by the department.

A. MEDARIS,
Chief Inspector, Department of Inspection.

Police Departments

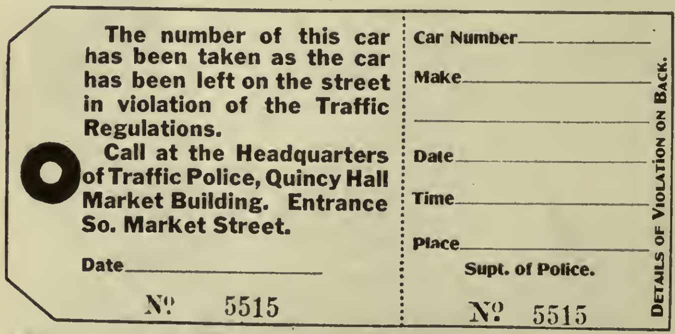
Tagging Traffic Offenders

Boston, Mass.—The traffic regulations of the city of Boston provide that no vehicle shall be left standing in a public street for more than twenty minutes between 6 A. M. and 6 P. M. As this rule was frequently violated, especially by shoppers, and as it was sometimes difficult for the policeman to locate the person actually responsible for this infraction of regulations, the following system has been tried out:

When an officer observes an automobile standing unattended in a street longer than the time allowed, he notes the number of the car and ties a tag upon the machine, directing the owner to call at Traffic Headquarters at a stated time. There the owner is questioned, and it is ascertained whether or not he is a persistent offender or has merely acted in ignorance. The commanding officer may then determine whether the case should be carried into court. The officer retains one-half of the perforated tag on which to make his report.

In down-town districts this plan has been successful in reducing the congestion due to the unauthorized parking of private cars.

EDWIN U. CURTIS,
Police Commissioner.



The number of this car has been taken as the car has been left on the street in violation of the Traffic Regulations.

Call at the Headquarters of Traffic Police, Quincy Hall Market Building. Entrance So. Market Street.

Date____________

Nº 5515

Car Number____________

Make____________

____

Date____________

Time____________

Place____________

Supt. of Police.

Nº 5515

Details of Violation on Back.

THE TAG THAT HELPS TO PREVENT TRAFFIC CONGESTION IN BOSTON

Fire Departments

Libraries in City Fire Stations

Boston, Mass.—Under any circumstances a considerable part of a fireman's time must be spent in enforced leisure. This idleness is tiresome to the fireman himself, as the means of recreation afforded by the average station house are very limited. Boston has decided upon a plan of utilizing this spare time in a way which will interest the firemen and increase the efficiency of the Department.

The city has included in its Fire Department appropriation approximately $2,500 to establish small libraries of standard books in each fire station. The books in question will cover the following subjects of especial interest to the men:

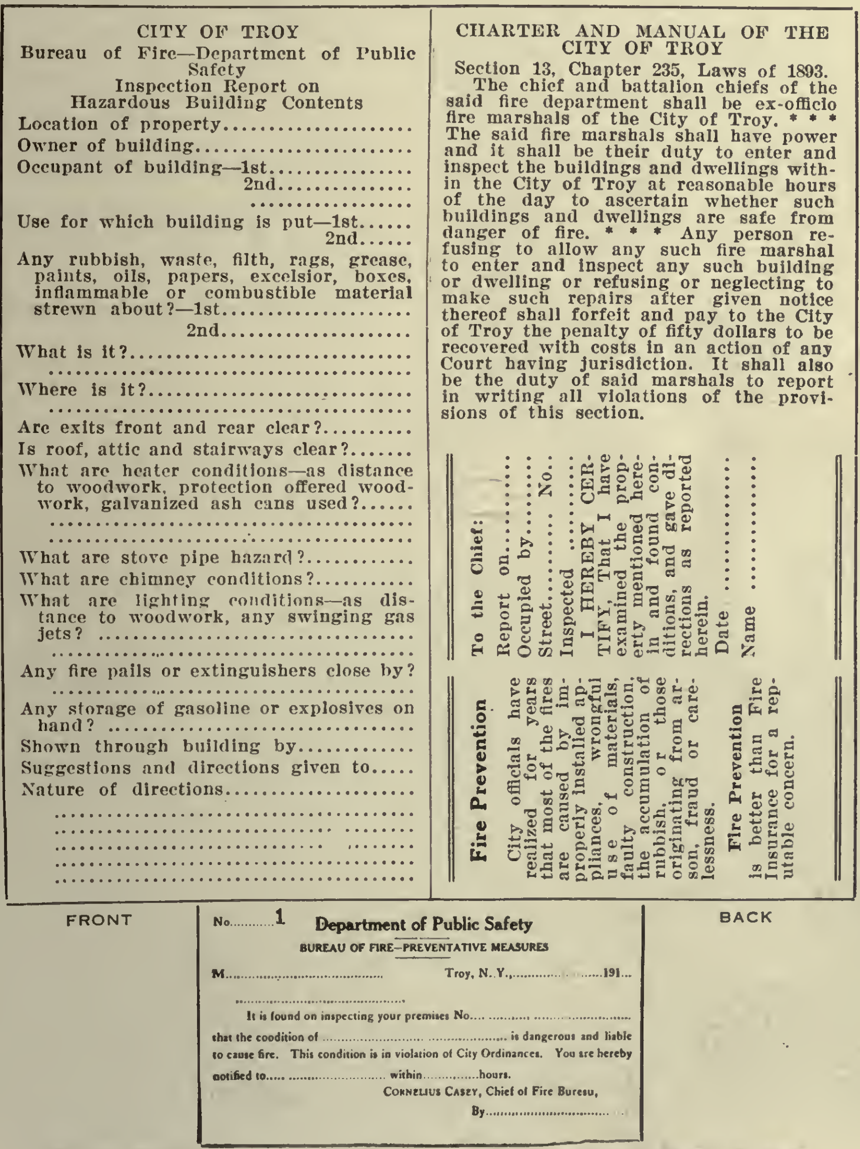
Fire Prevention and Fire Fighting
Automobile Machinery
Gas Engines
Steam Engines
Marine Engines
Building Construction
Electricity and Telegraphy
Hydraulics

JOHN R. MURPHY,
Fire Commissioner.

Fire Hazards Not Allowed

TROY, N. Y.—Since "Clean-up Week"—May 3-8—the city of Troy has felt itself much nearer the ideal of public safety. During the previous week the Chief of the Fire Bureau caused a thorough inspection to be made of all yards, cellars and alleyways by a detail of firemen. After Clean-up Week a reinspection was made to determine what improvement had been made in cleaning and in gathering up and removing rubbish, paper, old boxes, etc. The improvement was found to have greatly exceeded expectations in the matter of the thoroughness with which the work was done.

In the public schools lectures were given on fire prevention and sanitation, and, thus instructed, the children aided materially in making the week a success. The merchants throughout the city displayed great interest in the undertaking, and devoted much space to advertising and displaying brooms, shovels, etc. The bus lines carried stream-



CITY OF TROY
Bureau of Fire—Department of Public Safety
Inspection Report on
Hazardous Building Contents

Location of property......................
Owner of building........................
Occupant of building—1st................
2nd...............
....
Use for which building is put—1st......
2nd......
Any rubbish, waste, filth, rags, grease, paints, oils, papers, excelsior, boxes, inflammable or combustible material strewn about?—1st....................
2nd....................
What is it?................................
....
Where is it?...............................
....
Are exits front and rear clear?..........
Is roof, attic and stairways clear?.......
What are heater conditions—as distance to woodwork, protection offered woodwork, galvanized ash cans used?......
....
....
What are stove pipe hazard?...........
What are chimney conditions?...........
What are lighting conditions—as distance to woodwork, any swinging gas jets? ....
....
Any fire pails or extinguishers close by?
....
Any storage of gasoline or explosives on hand? ....
Shown through building by.............
Suggestions and directions given to.....
Nature of directions......................
....
....
....
....

CHARTER AND MANUAL OF THE CITY OF TROY
Section 13, Chapter 235, Laws of 1893.

The chief and battalion chiefs of the said fire department shall be ex-officio fire marshals of the City of Troy. * * * The said fire marshals shall have power and it shall be their duty to enter and inspect the buildings and dwellings within the City of Troy at reasonable hours of the day to ascertain whether such buildings and dwellings are safe from danger of fire. * * * Any person refusing to allow any such fire marshal to enter and inspect any such building or dwelling or refusing or neglecting to make such repairs after given notice thereof shall forfeit and pay to the City of Troy the penalty of fifty dollars to be recovered with costs in an action of any Court having jurisdiction. It shall also be the duty of said marshals to report in writing all violations of the provisions of this section.

To the Chief:
Report on...........
Occupied by.........
Street......... No...
Inspected ....
I HEREBY CERTIFY, That I have examined the property mentioned herein and found conditions, and gave directions as reported herein.
Date ....
Name ....

Fire Prevention.

City officials have realized for years that most of the fires are caused by improperly installed appliances, wrongful use of materials, faulty construction, the accumulation of rubbish, or those originating from arson, fraud or carelessness.

Fire Prevention is better than Fire Insurance for a reputable concern.

FRONT

BACK

No...........1 **Department of Public Safety**
BUREAU OF FIRE—PREVENTATIVE MEASURES

M.. Troy, N. Y.,......................191...
....

It is found on inspecting your premises No.... ....
that the condition of .... is dangerous and liable to cause fire. This condition is in violation of City Ordinances. You are hereby notified to..... .... within...............hours.

CORNELIUS CASEY, Chief of Fire Bureau,
By..............................

REPORT FORMS USED BY INSPECTORS OF FIRE HAZARDS IN TROY, N. Y.

ers announcing Clean-up Week. The work was under the supervision of the Commissioner of Public Works and his Deputy, and reflects much credit upon both for the thorough manner in which it was performed.

The regular fire prevention work of the Fire Bureau is performed by the captains and lieutenants, each of whom gives about two days a week to inspection work. The report to the Chief is made on the form reproduced on page 33. When it is necessary to notify an owner or occupant that dangerous conditions exist on his premises, the small form is used. The offender is given a certain number of hours to correct the condition, and if he fails to comply with the order he can be taken before a police magistrate and fined. By this regular, persistent work it is endeavored to minimize the fire danger in this industrial city.

CORNELIUS A. CASEY,
Chief of Fire Bureau, Department of Public.

City Managers

Pay Both in the Same Envelope

Glencoe, Ill.—Having discovered, like other municipalities, that too much time was required for the collection of vehicle and dog taxes, Glencoe hit upon a simple plan for expediting payments. The village owns its water service, and it was realized that everyone in the place who had a car or a dog was obliged to pay a water bill each quarter. Accordingly, a small sticker was affixed to the water bill reminding the citizen that his vehicle and dog taxes were due, and might be paid at the same time. The results of this scheme have been most gratifying, and the work of the collectors has been reduced, especially in reaching the newcomers to the village who had no knowledge of these special taxes.

H. H. SHERER,
Village Manager.

Recreation Departments

A Properly Financed Municipal Band

Salina, Kans.—More and more the eyes of the people are opening to the fact that band concerts are a very essential part of the life of a community. The band is a public service institution and is one of the town's best advertising mediums; to be-

THE MUNICIPAL BAND OF SALINA, KANS.

long to it or to listen to it creates home town interest.

The problem of financing has deterred many communities from organizing bands. The usual method has been to collect money, by subscription, from more or less willing business men. This has been unsatisfactory, for the reason that it puts the band on a charity basis and means disagreeable work for the soliciting committee. Also, the patient citizen who contributes receives no more benefit from the concerts than the less public-spirited man who does not. Further, the amount realized seldom provides sufficient funds to pay the total expenses of the band.

Although a band must pay for a hall and for lighting and heating it, buy music, uniforms and instruments and hire a leader, it is often expected to donate its services on public occasions. One of the most discouraging things that can happen to such an organization is to have out-of-town bands hired for important ceremonies, while the local band is asked to give its services when money is not available.

To correct this state of affairs, the first thing to do is to improve the band, and this is best done by concentrating upon one band, and assuring it of support as long as it is satisfactory. The management of a band cannot plan for the future with uncertain financial backing.

The experience of Salina shows how one city met the problem. Six years ago Salina had no band. In 1915 the Salina Boys Band was organized and existed on the dues paid by members and the money received from a few engagements. Later the City Council appropriated $600 a year, which kept the band going until the citizens authorized a tax levy for the support of a Municipal Band.

To secure popular support of the proposed tax a vigorous campaign was undertaken by obtaining the indorsement of the Chamber of Commerce, the Rotary Club and similar organizations. The daily papers assisted. On the night before the election an open air concert was given, and the next morning the band was out in cars, playing to remind the voters of their duty. The ballots showed a return of 4 to 1 for the levy.

Under a five-year contract with the Municipal Band, Salina now pays $5,000 per year, in return for which the band is to give 50 concerts. For each important occasion on which the band is called out by the Mayor, such as a convention, parade, or public meeting, credit is given for one concert. With the sum assured by the contract, the band meets all expenses, and is able to pay its members for concerts and rehearsals.

Weekly concerts are now being given on Friday nights in the band "shell" which was built by the city and the business men at a cost of $3,000. On Wednesday night the band visits the small towns in the county, giving concerts only—no speechmaking is allowed. The citizens of the town, instead of joy-riding around in town or going to no place in partiular, pick up the members of the band and take the boys to the town visited. Sometimes we have as many as seventy-five or a hundred cars in the party. Thus the band assists in promoting good-fellowship between our town and its neighbors.

T. S. HOWELL,
Leader, Municipal Band.

Highway Departments

A City Tax on Gasoline

ST. LOUIS, MO.—Municipalities seeking new sources of revenue will be interested in the tax on the consumption of gasoline levied by the city of St. Louis. The ordinance was approved August 4, 1919.

It provides that all persons, firms or corporations selling gasoline must obtain a license. All licensees are required to file a quarterly statement with the Comptroller of the city showing the number of gallons of gasoline sold during the period. The amount of the tax, which takes the form of a fee for the license, is one-half cent for each gallon sold, payable at the end of the quarter.

The tax is stated to be an emergency measure, and the reasons leading to its adoption are set forth in the ordinance as follows:

> "The greatly increased automobile traffic upon the streets of the city of St. Louis and the concentration of automobiles in some of the principal thoroughfares of said city, causes

an unusual wear upon the surface of said streets and requires extensive repairs and frequent reconstruction, the expense of which cannot be collected as benefits against the abutting property owners, and is occasioned by owners of automobiles in all sections of the city of St. Louis, and additional revenue is required to provide for the expense of such repair and reconstruction."

It is estimated that this year the tax will produce about $100,000, and this sum has been set aside in the annual budget for the reconstruction and maintenance of the principal thoroughfares.

C. M. TALBERT,
Director, Department of Streets and Sewers.

Libraries

School Children Coöperate with City Library

Mt. Vernon, N. Y.—The problem of teaching children to understand and accept personal responsibility for municipal property is being met successfully in Mt. Vernon, N. Y.

In the ten elementary schools, each class elects a leader, and each school two members to represent it on the governing board, or Library Council. This Council meets bi-monthly with the children's Librarian, the meetings being conducted by the president and secretary, elected by the Council. Each school takes supervision of the Children's Room for one week, during which time two members appointed by the school councilors are on duty to see that no books are taken without being charged, and to maintain general order. The Council also assumes charge of the collection of fines on books overdue. The matter has been one of personal, class, and school honor, and there has been keen rivalry among the schools to be the first to have a clear record.

An active part in the supervision of the room gives children a new interest in the Library, and the current discussion of problems of library and community is teaching them to view public property in a new light.

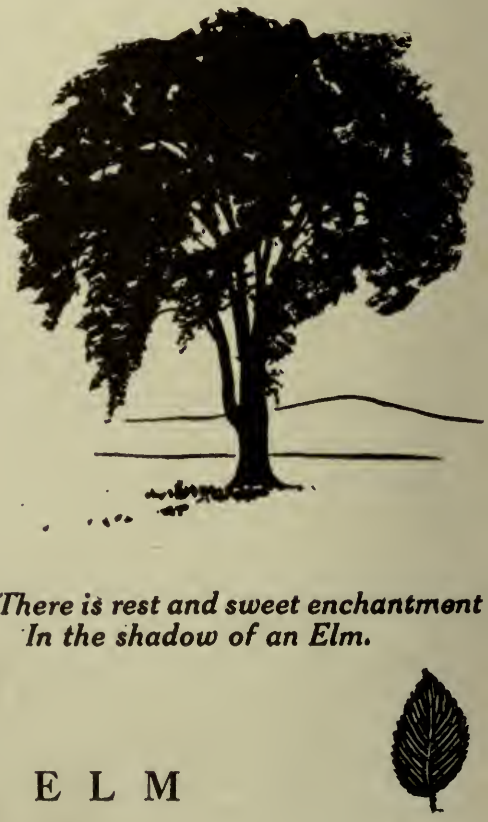
LOUISE F. SWIFT,
Children's Librarian, Public Library.

City Foresters

Our Friends the Trees

Newark, N. J.—So far as is known, the Shade Tree Division of the Department of Parks and Public Property of Newark was the first city department to issue an annual Arbor Day leaflet. We were familiar with the beautiful booklets on tree planting published by the several states, usually under their departments of education, but it was felt that the ideals for city streets in Newark could not be realized except by direct appeal to the citizens.

The most effective way to reach the largest proportion of the citizens is through the schools. After several years of this work, in which we had the coöperation of


There is rest and sweet enchantment
In the shadow of an Elm.
E L M

the Board of Education in distributing our leaflets, we prevailed on the school authorities to join us in their publication. Thus for a number of years the Board of Education has borne half the expense, as well as giving us potent aid in distributing the leaflets in the schools in connection with the exercises on Arbor Day.

One year we published a leaflet called "The Tree Calendar," containing sketches of the activities of the trees from month to month, and telling how the children could help the trees in each season. Another leaflet entitled "Know Your City Trees" pictures striking contrasts between ideally planted streets and a treeless desert, and contains the addresses (street and number) of the worthies of our local tree world. Another year an eight-page pamphlet was issued under the title "Four Centuries of Trees in Newark." It gave snapshots of comment from old records and letters showing that we had cared for our trees in each century of our history, the oldest ordinance for the protection of trees dating back to 1676, ten years after the founding of the settlement in the wilderness. The 1918 leaflet was devoted to war gardens.

The 1920 pamphlet was twice as large, and opened with a statement by the Superintendent of the Shade Tree Division of the Department of Parks and Public Property, introducing the school children to the trees, the other pages being devoted to pictures of the more common trees of the locality, in silhouette, as on page 36, with a descriptive verse beneath each one. The pamphlet is not only artistic in itself, but serves its purpose of introducing the children to the trees, by making them familiar with the typical outline of the various species.

CARL BANNWART,
Superintendent Shade Tree Division, Department of Parks and Public Property.

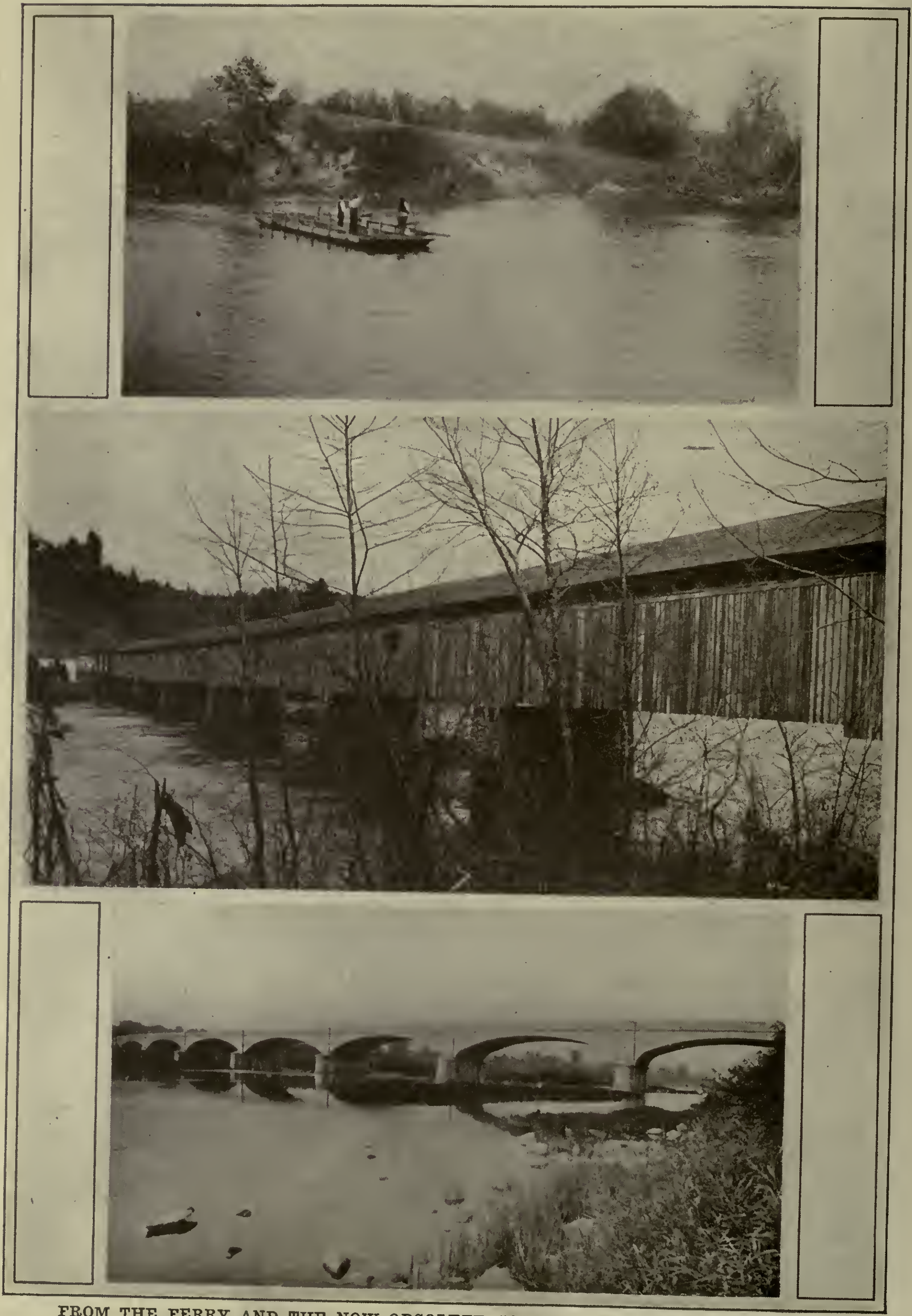
What Do Playgrounds Cost, and Are They Worth While?

THE table given below has been compiled from information furnished by Miss Mildred A. Clough, City Clerk of Kalamazoo, Mich., who submitted a questionnaire on playgrounds to cities of between 30,000 and 50,000 population.

It is notable that the verdicts from those cities which reported the heaviest expenditures are the most enthusiastic and outspoken. Brookline, Mass., which paid $500,000 for its playground and spends $7,100 yearly on its up-keep, regards it as a "paying investment." Fitchburg, Mass., appropriating $5,000 a year on its six playgrounds, says that "no feature of the city has done so much good." Macon, Ga., already spending $8,000 a year, intends to establish a playground for colored children. Newton, Mass., appropriates annually $21,000 to $25,000 for supervision, maintenance and equipment, and the opinion of its citizens regarding the work is shown by the fact that last year a new playground valued at $125,000 was donated to the city. The final word of approval comes from East Orange, N. J., which votes $8,500 for annual costs: "It is the only thing taxpayers never complain about."

City	Cost of Equipment	Cost of Maintenance (Annual)
Amsterdam, N. Y.	$1,800.00	....
Auburn, N. Y.	....	$1,744.00
Aurora, Ill.	5,000.00	....
Brookline, Mass.	5,000.00	7,100.00
Butte, Mont.	3,100.00	3,000.00
Cedar Rapids, Ia.	305.00	500.00
Charlotte, N. C.	500.00	1,000.00
Colorado Springs, Colo.	3,500.00	2,500.00
Columbia, S. C.	3,500.00	4,000.00
Dubuque, Ia.	1,500.00	1,000.00
Easton, Pa.	5,000.00	1,500.00
East Orange, N. J.	13,500.00	8,500.00
Everett, Mass.	400.00	....
Fitchburg, Mass.	5,000.00	....
Fresno, Calif.	17,500.00	....
Jackson, Mich.	1,500.00	2,000.00
Jamestown, N. Y.	....	1,900.00
Kenosha, Wis.	5,748.54	1,500.00
Lansing, Mich.	300.00	350.00
Newport, Ky.	....	....
Lima, Ohio	2,500.00	....
Lorain, Ohio	2,000.00	....
Lynchburg, Va.	2,000.00	2,500.00
Macon, Ga.	2,500.00	8,000.00
Madison, Wis.	1,000.00	2,000.00
Mt. Vernon, N. Y.	69.81	1,164.21
Newport, Ky.	1,000.00	1,000.00
Newport, R. I.	1,000.00	5,500.00
New Rochelle, N. Y.	2,400.00	9,374.00
Newton, Mass.	4,000.00	19,500.00
Norristown, Pa.	1,000.00	....
Orange, N. J.	25,000.00	8,575.00
Oshkosh, Mich.	....	6,293.97
Perth Amboy, N. J.	....	2,500.00
Pittsfield, Mass.	1,500.00	3,000.00
Poughkeepsie, N. Y.	30,000.00	2,500.00
Shreveport, La.	....	500.00
Springfield, Mo.	3,000.00	5,000.00
Taunton, Mass.	1,500.00	2,829.50
Waltham, Mass.	8,000.00	4,000.00
Williamsport, Pa.	1,200.00	600.00
Wilmington, N. C.	2,000.00	....
Woonsocket, R. I.	4,000.00	500.00

The Evolution of River Crossings



FROM THE FERRY AND THE NOW OBSOLETE COVERED WOODEN BRIDGE, TO THE PERMANENT REINFORCED CONCRETE STRUCTURE OF TO-DAY

New Developments in Bituminous Concrete Pavements

By Theodore S. Oxholm

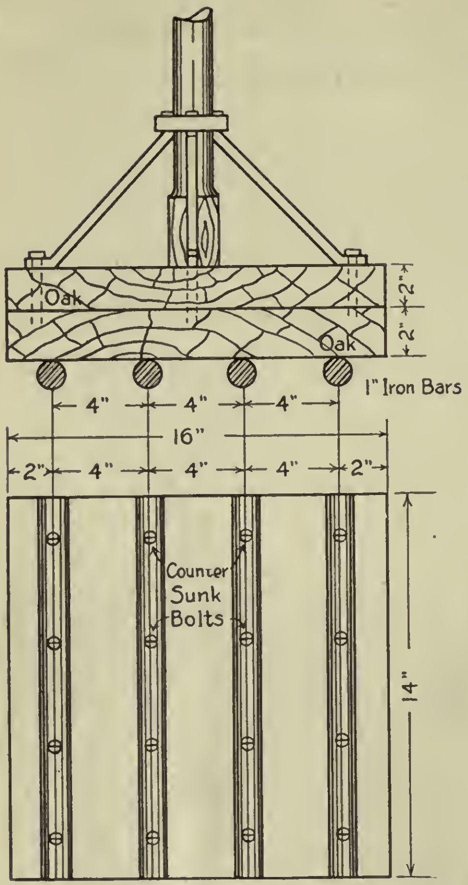
**Acting Consulting Engineer, Bureau of Engineering, Borough of Richmond,
New York City**

IN these days of vast expenditures for new roads and pavements the art of road-building has advanced rapidly from the practice of the former road overseer or commissioner of highways of a few years ago to the standard methods now employed by civil engineers, many of whom have had the privilege of taking a special course in highway engineering now offered by several of our leading colleges and universities. It is becoming increasingly difficult, therefore, to devise methods of construction which have merit and yet are not generally known to the profession.

THE AMBOY ROAD, STATEN ISLAND, NEW YORK, A BITUMINOUS CONCRETE PAVEMENT ALMOST CONSTANTLY SUBJECTED TO HEAVY TRAFFIC

Last spring the author, at the invitation of A. Swan, Jr., C. E., City Engineer of Trenton, N. J., made an inspection of sheet asphalt pavements in that city which were laid directly on the concrete foundation without a binder course. Mr. Swan explained that by the use of a special corrugated tamper designed by himself he had corrugated the concrete base so deeply and uniformly at right angles to the traffic that there has been no creeping of the asphalt wearing surface under heavy use for two or more years, and a considerable saving in cost had resulted by leaving out the binder course.

In the borough of Richmond the author has been using for some years concrete for pavement base composed of trap rock screenings instead of broken stone and sand, mixed six of screenings with one of cement. It was determined in a certain contract to use Mr. Swan's tamper. After about 300 feet had been tamped the assistant engineer, inspector and foreman on the work devised a roller made of a 2½-foot section of telegraph pole with bands of 1-inch round iron fastened around the roller and spaced 4 inches on centers; a long pole attached so that the roller could move easily, completed the outfit. The water was squeezed out of the concrete by a light roller, as used for concrete pavement, and then as the concrete was beginning to set, the corrugated roller above described was rolled across the base once for each section. The result was most gratifying, as a perfect series of depressions appeared 1 inch deep and 4 inches apart, uniform in character and extending the whole width of the base. It will readily be seen that this "washboard" surface will receive the asphalt or bituminous concrete and lock it so firmly to the base that creeping from lack of proper contact is pre-



SKETCH OF THE TRENTON, N. J., TAMPER

vented. It is thought that much of the creeping and rippling of the surface of bituminous concrete road surfaces is due to lack of proper contact with the base.

Proper Methods of Construction Which, Because of Their Neglect, Need Emphasis

Very often an old macadam road 5 or 6 inches in depth makes a suitable base for a bituminous surface, provided drainage conditions are or can be made good. Care must be taken, however, in preparing the old surface to make it as rough as possible so as to prevent creeping of the new surface. The bond of the old pavement must not be broken, for if it is its value is largely destroyed. Almost all old macadam roads are now surfaced with road oil, which presents a smooth surface in patches. The best method of removing this oil surface appears to be the old-fashioned one of picking by hand lightly so as not to disturb the bond of the heavier stone. Some roads of this type which have been built by the author are very inexpensive and are giving good service. They are edged with old stone paving block set in sand before the bituminous wearing surface is applied.

The subject of drainage is an important one to the road-builder. It is generally overdone, resulting in useless cost, or underdone, resulting in great damage to the pavement. It is not difficult for the engineer to tell with approximate accuracy where drainage probably will be necessary, and to make his preliminary estimates accordingly. Springs and wet places may be noted, and where changes of grades make additional cuts he should be prepared to underdrain when the work is under way and trouble has developed. The old-style stone drains, while efficient for a time, usually fill up in a few years, and damage is sure to follow. The author uses 6-inch vitrified pipe with open-covered joints in all trench drains, which, with suitable outlets, will give good service for many years.

One of the most important pieces of road work in the borough of Richmond which have been completed during the last few years is the paving of the Amboy Road, 9 miles in length, running through the center of Staten Island and forming part of the main-traveled route between New York and Philadelphia, Baltimore and Washington, and also New Jersey coast resorts. Three years ago work was begun on a contract for improving this road with bituminous concrete wearing surface 2 inches thick on a 6-inch concrete base. The specifications called for the use of Bermudez asphalt, as the traffic was very heavy. The pavement was laid 20 feet wide, and concrete edging 6 inches in width was built up monolithic with the base. Four-foot earth wings were graded down to a uniform ditch along the sides, except where passing through built-up sections where curbs and gutters already existed. The total cost of the work was $330,000, at pre-war prices, and after two years of service the appearance of this pavement is excellent and practically no repairs have been made. On the first section of about 3 miles it was noticed during the suspension of work for the winter that some transverse cracks had appeared; it was therefore decided to cut ¼-inch joints across the pavement as it was being laid, 300 feet apart, and fill with asphaltic cement. On the remainder of the work this was done, and no more cracks have occurred.

As the bituminous material for the wearing surface is brought onto the street it is dumped onto the base and shoveled into place for the rakers. The shovelers tread down the hot mixture so that it becomes compressed before the roller reaches it. This causes an unequal density in the completed work and tends to make the pavement uneven. One method of avoiding this is to have the entire amount of each load of hot mix shoveled and spread in adjoining locations. This causes the breaking up of the portion treaded down, and the rakers soon reduce the heavier portions to a uniform surface ready for rolling. Proper protection to the edges of bituminous pavement should always be provided, but is often neglected. If old paving blocks are not available, either concrete edging or a steel angle iron of proper design, anchored into the concrete base, will protect the pavement from undue wear. The failure to provide this protection soon results in the reduction of an 18-foot road width to one of 16 feet, and the narrower the road gets the more rapidly the pavement deteriorates.

Bad Practices Which Should Be Eliminated

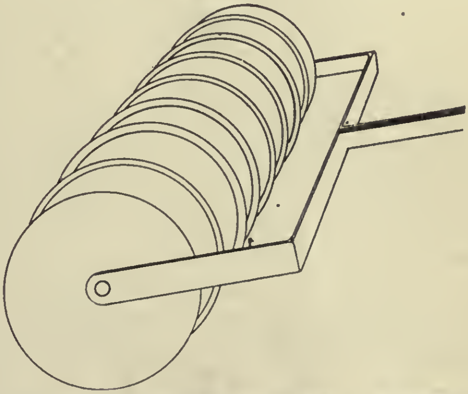
The placing of a bituminous concrete wearing surface on top of an old penetration macadam road as a base is sure to result in serious damage to the pavement. Wherever an excess of road asphalt exists in the original pavement, it will soften the new wearing surface over it and disintegrate it within a year.

While a liberal use of the oil burner in preparing the foundation will improve this condition considerably, yet in the author's opinion this form of old pavement provides a very poor base for a hot-mix wearing surface.

Where an old water-bound macadam pavement has been covered with 3 or 4 inches of penetration macadam, and it is desired to place a new wearing surface of bituminous concrete, the author has had good results from removing the penetration pavement entirely and forming a new crown and repairs to the old macadam with new ¾-inch stone and screenings.

One of the most important defects in bituminous pavements, and one which is undoubtedly caused by the great loads being carried by enormous trucks, is a pushing forward of the top of the wearing surface, creating waves and ripples that sometimes are so marked that the bituminous material has to be removed and replaced. In the opinion of the author, this is caused by requiring a too high penetration test in the asphaltic cement. The test has usually been placed at from 50 to 70 in cities near New York, but latterly the borough of Manhattan has gone to the other extreme and laid pavements at a penetration of 30. While the author believes that cracks in bituminous surfaces are preferable to ripples, and can be more economically repaired, yet a medium hardness should be called for; he suggests 45 to 50, and has been laying considerable pavement at 48 during the past summer.

Bituminous pavements adjoining the rails of street car tracks should be protected from disintegration caused by vibration of the rails. In many cities this has been neglected. It is impossible to properly compact the bituminous material under the head and flange of the rails. The vibration during the passage of cars destroys the bond of the bituminous material, allowing surface water to enter the space thus formed, and resulting in the final disintegration of the pavement. This defect may be obviated by the use of stretcher courses of stone blocks along both sides of the rails. The width of the stretcher area should be sufficient to permit the ordinary rail repairs to be made without cutting into the bituminous pavement.



CORRUGATED ROLLER TAMPER DESIGNED AND USED IN THE BOROUGH OF RICHMOND, NEW YORK CITY

Another method of construction is to pave up to a steel angle iron laid parallel to and adjoining the rails, the pavement then being practically independent of the railroad tracks.

The proper way for an engineer to find out defects in his own practice is to visit periodically other localities. He will generally find some condition better cared for than at home, and sometimes may find that he has solved a certain problem better than his brother engineer.

ACKNOLWEDGMENT.—From a paper prepared for, but not read, at the annual convention of the American Road Builders' Association.

Sewer Explosions

By G. W. Jones and V. C. Allison

Pittsburgh Experiment Station, U. S. Bureau of Mines

BECAUSE of the increased use of gasoline arising from the large number of automobiles, motor trucks and other gasoline-driven vehicles, also the large consumption of gasoline and other volatile liquids by cleaning works, paint factories and similar manufacturing establishments, there have been created new conditions to which present-day municipal engineers and chemists must give careful attention and consideration, namely, explosions in sewers due to the above sources.

During the period from 1913 to 1916 sewer explosions were especially numerous. Two explosions in Pittsburgh causing a great amount of damage, and others reported in New York City, Detroit and elsewhere, brought these new dangers forcibly to the attention of the public and of city governments. In Pittsburgh a coöperative investigation between the city and the United States Bureau of Mines was started to determine the causes and conditions which would produce explosions in sewers due to the accumulation of gasoline vapor. This investigation extended over the most of 1914, and many valuable data were obtained.*

During the last few years very little has been said or done in regard to sewer explosions from gasoline. Either the public has been educated concerning the hazards of dumping gasoline into sewers, perhaps largely through municipal regulations, or conditions have been unfavorable for the ignition of explosive mixtures when favorable explosive concentrations have arisen. At any rate, with the increased use of gasoline during the last few years and the present outlook for an even greater consumption in the future, dangers from these sources will require the attention of municipal authorities of all cities where gasoline is used in large quantities. Some cities have passed ordinances to prevent the dumping of inflammable wastes into sewers or to regulate the manner in which these wastes may be disposed of.

The Record of Explosions

Of the larger sewer explosions may be mentioned the two occurring in Pittsburgh, one in November, 1913, and the other in July, 1914. The causes of these explosions were not definitely determined, but the drainage was from a district containing a large number of garages and users of gasoline. Damages from the first explosion amounted to over $300,000. Several explosions have occurred in New York City. One is reported from that city in 1907; also in 1914 a sewer in East 42d Street exploded three different times. The damage was not extensive, since the sewer was 40 feet below the street level. Several are reported from Detroit. One occurred in January, 1914, and another in March, 1916. The damage from the one in 1914 was slight, amounting to about $7,000. The cause was laid to gasoline from automobile establishments. The 1916 explosion was due to the leaking of some 10,000 gallons of gasoline from a tank car into the sewer. The leakage from the tank car was caused by the freezing of the water trap on the bottom of the car and the forcing of a leak in the outlet valve. New Haven has had several explosions, the causes of which in most cases were doubtful, although some may have been due to gasoline. Explosions have been reported from Philadelphia,

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* Burrell, G. A., and Boyd, H. T.: "Quantities of Gasoline Necessary to Produce Explosive Conditions in Sewers." Technical Paper 117, U. S. Bureau of Mines, 1916.

Providence, Buffalo, Washington, Brooklyn, Cleveland, Los Angeles, San Francisco, Savannah, Baltimore, Louisville, Charleston, St. Paul, Hartford, Duluth and Kansas City.

Causes of Explosions

Many explosions in different cities have been definitely attributed to gasoline, some were due to illuminating gas, and others were of doubtful origin. In general, sewer explosions are due to one or more of the following causes: artificial or natural gas, inflammable wastes, sewer gas and gasoline. Other causes may be responsible in isolated cases, but the major number will fall under one of the above heads.

Natural or artificial gas may find its way into the sewer-mains by infiltration through the ground from leaky gas-mains in quantities large enough to produce explosive mixtures. The explosive limits of these gases are higher than that of gasoline, and larger quantities are necessary to produce explosions. On the other hand, these gases will diffuse much faster, and explosive conditions are quickly reached. If sewer manholes are ventilated, the gas in a short time passes out because of natural ventilation, and the explosive condition lasts only a short time.

It has been found that the greater number of explosions in sewers due to natural causes occur in stormy or flooded conditions, as after a thaw or heavy rain. This may be due to one of two things. Flooded conditions may cause the outlet of sewers to become submerged. Burrell found that sewers in this condition are very dangerous when gasoline is introduced in appreciable amounts. A great number of gasoline vehicles are continuously losing oils and gasoline wastes upon the streets, and this, with other inflammable refuse thrown upon the ground, is allowed to accumulate. These wastes do not evaporate readily in cold weather, but remain until a rain or thaw washes them into the sewers. On reaching the sewers the submerged outlets favor the accumulation of the gasoline vapor and give the inflammable liquids time to vaporize at the sewer temperature. If this is true, we may expect dangers from this source in the future and of greater frequency. Although each gasoline-driven vehicle may contribute only a small amount, the sum total of the thousands traveling the city streets in the aggregate may produce dangerous conditions.

Garages, dry-cleaning establishments and certain plants manufacturing paints, varnishes and similar products use large quantities of inflammable liquids. These are used until too dirty for further service, and are then disposed of in the easiest manner possible, often by dumping them into the sewers. Other wastes in addition to gasoline are benzol, washings from automobiles and the like, which may find their way into the sewers.

Another cause may be sewer gas. The decomposition of organic matter produces methane along with nitrogen, carbon dioxide and perhaps small quantities of other gases. In certain cases such as dead ends of sewers where deposits are allowed to accumulate and ventilation is poor, methane may be produced in dangerous proportions. Methane is a gas of a high rate of diffusion and may easily find its way out of the ventilated manholes. Other gases are produced along with methane, and the oxygen is used up in bringing about the decomposition of the organic matter, leaving an excess of inert nitrogen. This atmosphere usually is deficient in oxygen, and an explosion cannot occur. The danger from sewer gas is more that of suffocation of unprotected workmen than the producing of explosions. Sewers of a large capacity have usually a high rate of discharge, and conditions favorable for the production of sewer gas are eliminated.

Ignition of Gases in Sewers

Explosions in sewers may be brought about by open lamps or flames carried into them by workmen, sparks from street car tracks near the manholes, hot cinders or sparks from locomotives, sparks from tools used by workmen in the sewers for making repairs or prying off the manhole covers. In every city there are a great many conduits carrying electric wires for electric lights, telephone and power cables. These may possibly give stray currents which in turn produce sparks in the sewers.

Quantities of Gasoline Necessary to Produce Explosive Conditions in Sewers

Tests made by the Bureau of Mines indicate that the dangers resulting from small discharges of inflammable wastes from a large number of sources are not nearly as great as one would be led to believe, providing the sewers do not have submerged outlets, and that to create explosive conditions it is necessary that large quantities be dumped into the sewer and over a short period of time. No fast limits can be given, since the conditions in any two sewers are not the same. Some of the factors affecting the explosibility are volatility of the gasoline or waste, temperature of the sewer and sewage, pitch or rate of flow, volume of air space above sewage, and the mechanical construction—for example, open flow or submerged outlet.

Volatility of the Gasoline.—In a general way the hazard or tendency for producing explosions increases with the volatility of the gasoline present, or, what amounts to the same thing, its vapor pressure. Some low-grade gasolines and kerosenes at the ordinary sewer temperature have vapor pressures so low that explosive conditions are impossible.

Temperature of the Sewer.—The sewer temperature is a very important factor governing explosive conditions. Gasoline wastes having too low a vapor pressure at ordinary temperatures may easily produce explosive conditions by a rise in temperature. Vapor pressures of gasolines increase very rapidly with a small rise in temperature. Increased temperatures in sewers may be brought about in certain locations by introduction of live steam or hot liquid.

Rate of Flow.—Gasoline requires time for its vapor pressure to reach equilibrium with the air in contact with it. With a certain gasoline having a certain vapor pressure at a certain temperature, a certain amount of gasoline vaporizes until its maximum vapor pressure at that temperature is reached. Since gasoline vapor is several times heavier than air, diffusion is very slow unless agitated by air currents. In this case only a very small film of air above the gasoline contains gasoline vapor, and only the air film immediately in contact with the gasoline takes up an amount equal to the vapor pressure of the gasoline. The air a few inches above the gasoline may be practically free from gasoline vapor unless a considerable length of time is allowed for diffusion. A sewer with a high rate of flow removes the gasoline waste from the sewer before the gasoline has time to vaporize to its fullest extent. Also, the vaporized gasoline in contact with gasoline, since it is very much heavier than air, is carried along with the sewage by friction and discharged with the sewage without reaching the upper air stratum in the sewer.

Volume of Air Space.—A given surface of gasoline vaporizes at a rate depending upon its temperature, other conditions being constant, and the time necessary to make a given space explosive will depend upon the volume of the inclosed air space. In other words, of two sewers with the same surface of gasoline exposed at the same temperature, the one with the larger air space above the gasoline will require the longer time to produce explosive conditions.

This fact may explain why explosions in sewers are more common in rainy or stormy weather. The sewers become nearly filled with water, and only a small air space is left above the sewage. This small air space is more quickly made explosive than at other times when the air space is large in comparison to sewage.

Open and Submerged Outlets.—All the above factors produce favorable conditions for explosions of the sewer has a submerged outlet. Gasoline is lighter than sewage and floats on the top. The entrapped gasoline accumulates, since there is no way of its getting out. In a very short time a large amount may accumulate, and in the flooded condition there is only a small air space in contact with the gasoline, and it remains in contact with this small air space until it has had time to make explosive all parts of the air space. If time is given and there is sufficient gasoline present, explosive conditions will result throughout the entire sewer.

On the other hand, open-flow sewers carry gasoline wastes out of the sewer usually before an appreciable amount has had time to vaporize, at least to produce explosive conditions. The film of air in contact with the sewage, which may be explosive, is carried along with the sewage by friction and discharged at the outlet.

The Results of Investigations

In order to study the conditions which produce explosions in sewers, the United States Bureau of Mines and the city of Pittsburgh coöperated in making tests in a representative sewer in Pittsburgh. The Negley Run sewer, which drains a large section of the city, was chosen. It is 8 feet 3 inches wide by 8 feet 6 inches deep. The entire distance from the manhole where the gasoline was introduced to the outlet into the Allegheny River was 2,706 feet. The velocity was determined by dropping pine floats into the upper manhole and noting the time taken to pass each succeeding manhole. The average velocity of the sewage was found to be 6.45 feet per second. The depth of flow was about 8 inches and the grade 0.90 per cent. In the first test 55 gallons of refinery gasoline at a specific gravity of 67.5° Be. was dumped into the sewer at the upper manhole all at once. Samples of the gas were taken at the different manholes at short intervals and analyzed. Mr. Burrell made the following comment:

> "One gallon of gasoline if entirely vaporized produces about 32 cubic feet of vapor at ordinary temperature and pressure. If 1.5 per cent of gasoline be adopted as the low explosive limit of mixtures of gasoline vapor and air, 55 gallons of gasoline would produce enough vapor to render explosive the air in 1,900 linear feet of a 9-foot sewer, provided the sewer air and the gasoline vapor were perfectly mixed. It will be noted how far theoretical conditions differ from the conditions of the test as follows:
>
> First, the gasoline flowing with the sewer water was rapidly carried past any particular point; second, only the lighter parts had a chance to evaporate at any point, and, third, gasoline vapor is about three times as heavy as air, so that mixing of vapor with air at an appreciable distance above the sewer water would be slow. The significant fact is that 2.19 per cent was the largest quantity of gasoline vapor in any sample. Only very small proportions were found at any manhole 10 minutes after the introduction of the gasoline.
>
> It is evident that one barrel of gasoline (55 gallons) poured all at once in a manhole of a fast-flowing sewer renders the air explosive for only a few minutes at any particular point."

Tests were also made on the same sewer to study the effect of submerging the outlet. "The results of the tests prove that with a sewer submerged by high water, extremely dangerous conditions can result from a small amount of gasoline." The test proved that when as little as 5 gallons of gasoline or light oils were allowed to escape at one point, as from garages and dry-cleaning establishments, highly dangerous conditions may result.

Out of 6,553 tests made by the city of Pittsburgh, only 4 showed 0.5 per cent of gasoline vapor or over. These tests were made over a period of about one year. This indicates that small discharges of gasoline into sewers do not create dangerous conditions normally unless the outlet is submerged. Troubles are generally caused by large quantities introduced all at once. In every case the explosive mixture was close to the surface of the water and did not extend far into the upper air.

"When the sewer was bulkheaded to parallel conditions such as would prevail if the sewer outlet was submerged, a dangerous condition resulted from dumping one barrel (55 gallons) of gasoline at the rate of 5 gallons per minute into the sewer at one point. At some places there existed a dangerous atmosphere 5 hours after the gasoline had been dumped in."

Explosive Limits of Gasoline Vapor and Air

No exact figures can be given for the explosive limits of gasoline vapor and air mixtures unless the conditions under which the explosion was produced are carefully stated. The explosive limits vary, depending upon the size, shape and material of the containing vessel, method of ignition (that is, whether the explosion takes place upward or downward), source of ignition (for example, a flame, electric sparks, incandescent filaments), also to a less extent upon the effect of pressure and temperature. In general, when considering the paraffin hydrocarbons, the higher the molecular weight the narrower the explosive limits. The explosive limits of methane are: low limit 5.5 per cent,* high limit 14.5 per cent; methane, low 2.5 per cent, high 5 per cent; and gasoline, low 1.5 per cent, high 6.0 per cent. G. A. Burrell made extensive tests on the explosive limits of gasoline vapor, trying different sized containers and sources of ignition. When using a Hempel explosion pipette of 100 c.c. capacity, using mercury as the confining liquid and sparking with an induction coil across platinum terminals, the lower limit of complete inflammation was found to lie between 1.9 and 2.0, with an upper limit of 5.4 per cent. He next tried a 2,800 c.c. vessel, and the mixture was sparked by drawing two copper wires apart through which a current was

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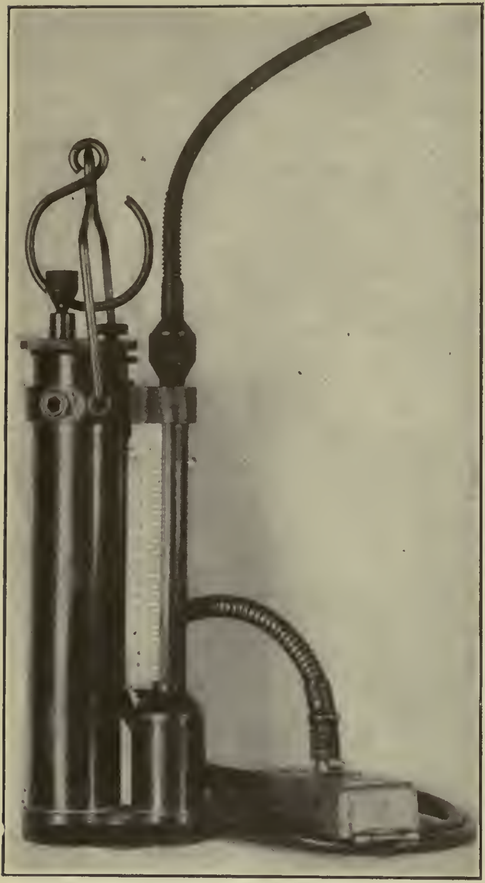
* Burrell, G. A., and Gauger, A. W.: "Limits of Complete Inflammability of Mixtures of Mine Gases and of Industrial Gases and Air." Technical Paper 150, Bureau of Mines, 1917.



APPARATUS FOR DETECTING LOW PERCENTAGES OF GASOLINE VAPOR IN SEWERS

flowing. The results were: low limit 1.5 per cent, and upper limit of complete inflammation between 6.0 and 6.4 per cent.

The Ignition Temperature of Gasoline-Air Mixtures

"The ignition temperature of a gas is that temperature to which gases [gasoline and oxygen in this case] must be heated, so that when brought in contact with one another they will immediately inflame" or "that temperature at which rapid self-heating takes place." The ignition temperature as found by Burrell is about 530° C.

Detection of Gasoline

A. D. Little describes an apparatus for detecting gasoline vapor in sewers.* The device was such that tests could be made in the field. In this way many samples could be determined in a day, and first-hand information was obtained as to the conditions in any particular sewer. The apparatus consisted of a long rubber sampling tube aspirator connected to the outlet cock of a priming spark plug. The sample of gas is taken in a collapsed rubber balloon slipped over the end of the spark plug. When the balloon is inflated with the gas sample, a spark is established at the terminals of the plug, and if gasoline vapor is present in any amount from about 1.1 per cent up to a mixture too rich to explode, it will manifest itself by a sharp explosion bursting the rubber bag. If the mixture is suspected too rich, the sample is diluted and sparked again. O. Hufeland† makes use of an ordinary automobile pump to fill toy balloons in which the samples are taken. A long tube extends into the sewer, and the gas is drawn out by means of the pump. The gas from the toy balloon is forced against a lighted match, and it is noted whether an explosion takes place.

In order to meet the demand for an apparatus to detect lower than inflammable percentages of gasoline in the sewers, the following apparatus was devised‡ by the Bureau of Mines for the purpose of detecting small percentages of gasoline vapor. It is very desirable to have an apparatus that will detect low percentages of gasoline in order that dangerous conditions may be properly dealt with before explosive conditions are reached.

The principle upon which the operation of this instrument or detector is based is simply that the contraction in volume obtained by burning the gasoline out of a sample of gas is proportional to the amount of gasoline present in the original sample. The combustion takes place in the detector itself through the action of a platinum glower heated with an electric current, the detector and the small battery which furnishes the current being a complete unit. The contraction is measured and indicated on a scale previously calibrated to show the per cent of gasoline directly. When the sample is explosive, some of the water is forced out of the instrument, but no harm is done, since the detector is of a rugged construction. If the sample is above the explosive limit, the gas on burning expands and gives a negative reading. The detector is shown in detail in the second illustration. Essentially it is a U-tube which is nearly filled with water; the sample is drawn in the sample chamber *p* by opening the inlet valve *b*, blowing into the rubber tube *d*, until the water appears in the cup *a*, and then releasing the rubber tube and allowing the water to regain its original level. The outlet valve *b* is closed and the glower *h* heated white hot by passing an electric current through it. The glower burns out the gasoline vapor. When the combustion is complete, the current is turned off and the detector shaken to cool the gases to normal temperature. The water in the large reservoir rises in the sample chamber *p* to take the place of the gasoline vapor which was burned, and the water level in the gauge glass drops to a point on the scale indicating the per cent of gasoline vapor. The current for heating the glower is obtained from an Edison mine lamp battery. It requires about four minutes to make an analysis. The apparatus has an interchangeable scale for different gases. The photograph shows the instrument with a methane scale. The gasoline scale extends from 0 to about 1.5 per cent. The range is from about 0 to the lower explosive limit.

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* Little, A. D.: "Detecting Gasoline in Sewers," *Municipal Journal,* Vol. 38, 1915, page 476.

† Hufeland, O.: "Explosions in Sewers," *Engineering Record,* September 12, 1914, page 307.

‡ Milligan, L. H.; Crites, D. O., and McKitterick, J. J.: "A Study of the Burrell Gas Detector for Combustible Gases."

Gasoline as low as .04 per cent in air can be detected by smell, while with benzol much lower quantities can be detected in this manner. Other gases are usually present in sewers which tend to obscure the gasoline odor. When apparatus for analyzing the gases is not at hand, this method may be of value for detecting the presence of gasoline vapor.

Municipal Regulations for the Disposal of Inflammable Wastes

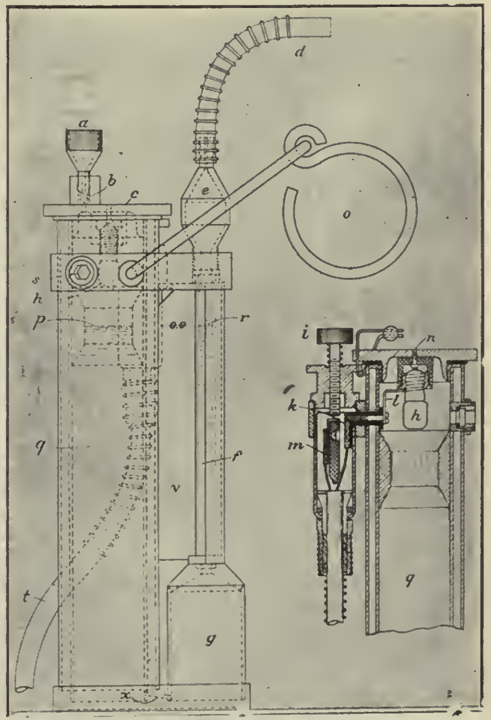
In an endeavor to prevent explosions from inflammable wastes, many cities have passed ordinances regulating the manner in which these wastes may be disposed of. The authors are familiar with only a few such regulations that have come to their attention. Many other cities may have better means of controlling the situation than the regulations which follow. An extract from the code of ordinances of the city of New York is as follows:

Section 561.—No connection with or opening into any sewer or drain in the city of New York, either public or private, shall be made for the conveyance or discharge, directly or indirectly, into said sewer or drain, of any volatile inflammable liquid gas or vapor; it being noted that a volatile inflammable liquid is any liquid that will emit an inflammable vapor at a temperature below 160° F.

Section 562.—Every occupant of any premises which may be connected with a sewer or drain, public or private, who shall use or permit or allow to be used said sewer or drain for such purposes as hereinbefore specified in Section 1, and every owner of any premises who shall use, permit or allow the use of such sewer or drain for such purposes shall be deemed to have violated the provisions of this ordinance and shall be guilty of misdemeanor and shall be punished upon conviction thereof by a fine of $50 or imprisonment for 30 days (Ord. app. July 6, 1906).

Extract from the Regulations of the Municipal Explosive Commission:

Section 276.—No garage permit authorizing the storage of a volatile inflammable oil shall be issued for any premises which are not provided with an oil separator, trap or other similar apparatus attached to the house drain for the purpose of preventing volatile inflammable oils from flowing into the sewer, provided, however, that the Fire Commission may, upon the recommendation of the Municipal Explosive Commission, exempt from the



DETAIL OF DETECTOR DEVELOPED BY THE BUREAU OF MINES requirements of this section a garage draining into a short sewer line.

Section 396.—Each oil separator installed in a garage shall be connected to the house drain, and shall be so arranged as to separate all oils from the drainage of the garage.

In general, regulations require the installation of oil separators at places where appreciable quantities of gasoline are used. These generally work on the principle that gasoline and oil being lighter than water or sewage will float on the top, while the sewage is discharged from the bottom. The apparatus in every case should be simple in construction and work efficiently with all classes of sewage. There should be no sharp bends, valves or constrictions which may clog; otherwise its utility may be of no value.

The authors have attempted to give a summary of the conditions by which gasoline may become a dangerous factor at the present time in producing explosions in sewers, and to bring to the attention of the public and officials alike that although no very large sewer explosions have occurred during the last few years, this false sense of security should not induce municipalities to become negligent in enforcing regulations, since they may save a city in the end not only a large sum from damages but also the inconveniences which usually accompany explosions of sewers. Broken sewers may cause the spreading of diseases, flooding of homes and manufacturing establishments, and disorganization of public utilities near the district, which are of vital importance to the public at large. Wherever possible, sewers should be constructed with an open flow of as high a pitch as possible. If necessary to have submerged outlets, some method of mechanical ventilation should be installed. This is an expensive method and will not appeal to city engineers in general.

Large users of gasoline should be made to install mechanical separators, as are now required by some cities, and a rigid system of inspection should be provided. Frequent tests of sewer gases should be made, especially in the so-called "garage zones," for gasoline vapor. Testing apparatus should be used which will indicate as low as 0.1 per cent of gasoline, so that preventive measures may be taken before explosive conditions are reached.

Regulations should be provided for the storage of gasoline and inflammable wastes. If stored above ground, provisions should be made for disposing of it in case of leakage without its going into the sewers. If stored under ground, the tanks should be insulated from any possibility of leaking into the sewers by seepage.

Offenders should be rigidly prosecuted if the offense is due to negligence, and the public should be educated to the dangers of using the sewers for disposing of inflammable wastes.

Need for Coördinating Railroad and City Planning

By Walter McCulloh

Consulting Engineer, Niagara Falls, N. Y.

The town planner thinks of the ideals of wide streets, curved lines, rolling grades and all those arrangements which make for beauty and attractiveness. The railroad planner thinks of tangents and profiles, and endeavors to reach his objective with a minimum of curvature and a minimum of grades, consistent with cost of construction and operation.

Both are right, but when the railroad is in the city and a change of location is desirable, these two planners must become allies, not enemies. Neither the railroad nor the municipality which they represent should resort to the "steam roller method" of settlement of so important a question.

A review of the history of the railroad locations in New York and the New England States shows that the town was usually the first on the ground, and the railroad, following the practice of economical location and with a desire to reach business, passed as near to the heart of things as was practicable, where its freight and passenger business might be handled with the least expenditure of money and effort on its part and where the business from the community might be easily secured.

The town grows around and close to the railroad, until sooner or later its growth makes a plan for future development an absolute necessity.

Motor-Busses Will Aid Better City Development

But the Community Must Be Prepared to Pay a Higher Rate for Motor-Bus Than for Modern Trolley Transportation, with Which It Should Be Coördinated

By Walter Jackson
Consultant on Bus and Car Service, Mount Vernon, N. Y.

A SHORT time ago the writer made a traffic survey of an eastern city with the view of determining wherein the transportation facilities of the community could be improved. He had been asked, particularly, to go into the details of the street railway service and of the competing jitney-bus service, which were on a dog-eat-dog basis, with the overtaxed railway getting the worst of it.

On analyzing this community on a block-to-block basis, it was evident that the directions of its growth had been influenced more by its electric railway facilities than by any other factor. The better-grade suburban development consisted of two shoe-strings which extended along the rails to 2 miles beyond the city limits. In the angle formed by these diverging trolley routes, and beginning at a point within a mile of the city center, was a great area of splendid but almost vacant high-ground territory. Nor was this territory difficult to reach or traverse. It was bifurcated by a brand-new Warrenite highway, and almost all the intersecting streets were also covered with barely-touched asphalt.

Why had this area, so close to the city center and so thoroughly improved, been neglected in favor of territory beyond the city limits? For the simple reason that it had no trolley transportation. No one was holding the land for a rise. Indeed, one realtor more optimistic than truthful placed on his "For Sale" sign this significant legend: "Trolley cars will pass by here shortly."

Another part of the same city was rapidly changing from a foreign colony to a purely manufacturing district. Part of the colony had been extruded to an isolated section beyond the city line, but intercourse between the friends in the old and the new settlements was extremely difficult. There was no direct transit between the two areas except by a 2-mile walk or so up-hill and down dale. It was also unfortunate that there was no direct car service between the city center and the greater part of these two settlements. The foreigners in them were "cabined, cribbed, confined" to their own kind with little temptation to mingle with the larger life of the city.

Why There Were No Electric Railways

One naturally asks the question: Why did the local trolley company fail to keep pace with the growth of the community? The answers are several, but the most important are that the company's revenues had not increased fast enough under war conditions to sustain its credit and that the city had permitted the jitney bus to work how, when and where it pleased. The result was that with these leeches at work on what had been profitable, short-haul routes, the trolley had become so anemic that it had barely enough strength to carry on its original services. New routes rarely pay in the beginning, and they never pay at all if unfair competition arrives just as soon as a decent density is worked up through the pioneering of the railway.

Thus has come about the lop-sided suburban development of this community. It has spent millions for the opening up of healthful home-building areas, only to see its workers string out into other townships along trolley routes that had been built to tie neighboring communities together. This sort of thing was not good for the railway, because it increased the length of ride beyond the economic limit, and it was not good for the patrons, because it made them spend twice and even three times as much time on the cars as would have been necessary with more intratown transit available.

So, too, the electric railway can hardly be blamed for failing to build a connection between the two foreign settlements. In a few years more the older settlement will have been crowded out by the factories, whereupon the tides of travel will shift in entirely different and partly unforeseeable directions. Why should the company, therefore, build a route that would be a sure loss?

Why Doesn't the Jitney Bus Help Out?

Here someone may say: "Well, why can't the jitney bus take care of these trackless streets instead of running over the same congested highways as the street car?" Aye, there's the rub. Development of traffic is no part of a jitneur's life, except such traffic as is created by his greater frequency of service. In this city, for example, jitneurs swarm on streets where street railway travel was densest and rides were shortest in the old days. Now and then an adventurous soul tries the less-traveled trolley routes, but in two or three days he is back at the old stand in spite of the fact that his fellow-jitneurs may have staked him to free gasoline!

This condition illustrates the viciousness of jitney competition. It does not take advantage of the ability of the motor-bus to go anywhere. Yet it is this very quality of the motor-bus that is its one best claim to be a factor in city transportation. When the motor-bus merely follows in the groove cut by the street car, it adds to the congestion and slowing-down of traffic instead of relieving and speeding up traffic. The latter it can do only when it operates on streets different from those occupied by the trolley. But there is no money in traffic relief work so far as the independent bus operator is concerned.

Motor-Bus Operation by the Street Railway Itself Offers the Solution

Since the jitney-bus operator will not use his vehicle to develop new sections or to connect isolated districts having something in common, let us see if we cannot reasonably ask the electric railway to accept this task. In the old days we expected the electric railway to take the lean with the fat as a matter of course. Now that the fat has been fried out, we must approach this matter from a new angle. First of all, we must remember that it costs a great deal more to put down electric railway track than in the days of cheap steel rails and dirt or cobblestone roads; secondly, we have learned that changes in community life can turn a heavily-traveled trackway into a streak of rust; thirdly, no electric railway is hankering to take on any more paving

ONE TYPE OF PASSENGER MOTOR BUS USED TO HELP THE TRAFFIC PROBLEM burdens, franchise taxes and the like when motor-busses pay little more than license fees and nothing at all for breaking up paving.

But, fourthly, and most important, do we really want the electric railway to put down track in high-grade residential streets or anywhere else where maximum carrying capacity is not required? Should we not look upon every street as a potential busway and ask the local transportation system to treat its problems accordingly?

And, above all, we cannot expect the electric railway to show any enthusiasm unless it is assured that it will have a monopoly of all the popular-priced transit in the community, whether on rails or rubber. There can be no half-way house of jitney competition between the present monopoly by a privately-owned railway and the possible future monopoly by a publicly-owned railway. Every dollar that electric railways will spend to-day must be a protected dollar.

It is only through the coördination of street car and motor-bus service under one management that we can expect to get the most transportation for the least cost. We have seen that the one-man automatic safety car* enables the electric railway to give so good a service that there is little opportunity for jitney competition; but this fact does not absolve an electric railway from giving some kind of service where conditions do not permit the expense, or where it is undesirable to extend the trackway. It is therefore incumbent upon the electric railway to use the motor-bus for such service exactly as has been done by the British tramways for more than a decade past.

Auxiliary Benefits to the Electric Railway and the Public Cannot Prevent a Higher Fare for Bus Service

The jitney-bus operator in spite of all sorts of favoritism has not found the development of business outside of the best trackways to be worth while. We can hardly imagine, therefore, that an electric railway running a bus department and subject to the obligation of giving service rain or shine would find the bus business self-sustaining; and this is all the more likely because one of the thankless features of bus operation is that it is most valuable where the traffic is too thin to make any kind of transportation medium pay. But if the electric railway cannot make the bus a self-sustaining proposition, it can secure certain advantages not open to the independent motor-bus operator. Thus it can put off the construction of costly track extensions; give bus service on streets parallel to congested trackways, thus recouping itself for bus losses through the attainment of higher schedule speeds on the car routes; develop a short-cut service between factories and the principal residential districts, to avoid transferring large masses of rush-hour riders at but one or two overworked downtown intersections; and enjoy the use of a mobile corps of vehicles that can be employed to help out various routes or meet emergency traffic conditions (as during fires) far better than cars confined to rails.

Nevertheless, it must not be assumed that, even with these things in its favor, an electric railway can afford to conduct a bus service as cheaply as a street railway service which is dense enough, let us say, to call for a 5-minute or 7½-minute service. It can be put down as an absolute fact that the cost of a seat-mile on a bus is from 1½ to 2 times as great as for up-to-date street car operation on any but the most waterlogged systems. This factor has been found just as true by the writer, in studying American conditions, as by British engineers, in studying their own street-car and motor-bus services. It therefore follows that even a partially-subsidized motor-bus service must be conducted at a higher rate of fare than the local street-car service. Thus, the Sheffield (England) Tramways in 1918 charged its car riders an average of 1.3 cents per mile, and its motor-bus riders an average of 3 cents per mile, due in part to the higher cost of bus service and in part to the fact that such bus service was conducted chiefly on thin-traffic extensions.

What Coördination of Bus and Car Will Mean for Better City Planning

From what has been said, it is obvious that the motor-bus opens entirely new vistas in civic development, because every street is a potential travelway available immediately without the trouble of breaking up paving, securing consents from property owners, or going into litigation because of special privileges. The motor-bus uses the common highway and takes the same chance as any other vehicle in its goings and comings, instead of calling for a special structure with an implied right-of-way. With the motor-bus operated as a part of the street railway system, it will not be necessary to girdle civic centers with rails and a network of wires; nor will it be necessary for the city to have its growth circumscribed by straitjacketing to a few lines of rails when every street is a possible travel way. New areas can be opened up and be given service in direct proportion to their needs, whether transitory or permanent, without demanding a heavy fixed investment for track, power and overhead line regardless of the amount of travel. In short, those who desire more esthetic street conditions or transportation fitted to small but pressing or special needs can have it in the motor-bus at a cost bearing a fair proportion to the greater expense of giving such service. But those who still believe that the motor-bus of to-day can replace economically or spatially the street car on business thoroughfares or other heavy-traffic routes, are cherishing a vain hope. The jitney can break a street railway, but it cannot duplicate its service and meet its responsibilities as a taxpayer at anywhere near the same price.

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* See THE AMERICAN CITY for January, 1920: "Modern Car Service at Moderate Fares."

Street Lighting in Chicago

A Summary of the Organization Methods of Electric and Gas Street Lighting in the Metropolis of the Middle West

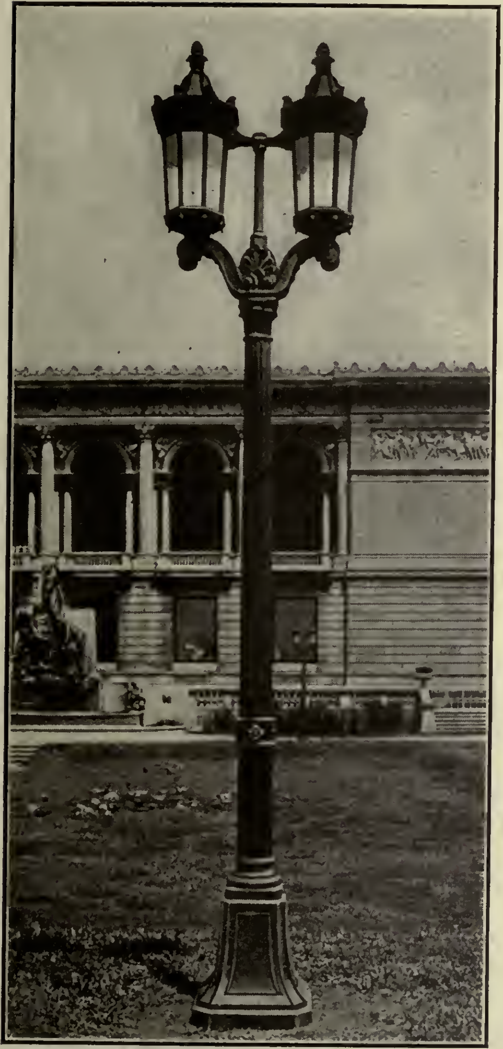
THE personnel of the Division of Electric Street Lamp Operation in Chicago is composed of a foreman of electric lamps, an assistant foreman, patrolmen, cleaners and repairmen. The patrolmen are assigned to routes or districts to make a nightly inspection of all lamps and to see that the lamps are in operation and that all globes are intact. In the event that a lamp is not operating or the globe is broken, the patrolman renews the lamp or globe at once, provided the fixture is suspended on an automatic cut-out hanger or operating on a low-potential circuit. If the fixture is operating on a high-potential circuit, without an automatic cut-out hanger, renewals are made the next day, after the circuit is shut down.

The cleaners are assigned to districts to clean lamps, globes and reflectors, the district being so arranged that the equipment will be cleaned at certain definite intervals of time, depending on the location of the district. The repairmen make all repairs to lamp fixtures which can be made in the field, and replace broken globes on fixtures suspended from fixed hangers.

One patrolman with an automobile patrols and renews all lamps in a district covering 1,500 600-candle-power, or 2,250 100-candle-power lamps. A patrolman on foot covers a district of 500 600-candle-power or 750 100-candle-power lamps, and a cleaner takes care of approximately 50 locations per day.

The bureau receives regular reports from the patrolmen, circuit repairers and load dispatchers. The patrolmen's reports give the location and time of all lamp outages, and renewals of lamps and globes. The circuit repairers' reports contain a record of all cases of trouble in any part of the secondary, or 5,000-volt, distribution system, such as the aerial and underground cable, the fixtures and the sockets. The load dispatchers' reports are a record of transmission or distribution failures, giving the time of the failure and the circuits affected, also the time when service is restored on the circuit.

The information contained in these various reports is carefully compiled and tabulated, and a monthly report is made showing the over-all efficiency of the lighting system for the month. These reports also reveal the weak spots in the lighting system, inasmuch as the cases of trouble are tabulated under different headings of causes, and in this way improvements are continuously being made in the system. The reports show that a large percentage of lamp outages have been due to failures in the automatic cut-out hangers. Accordingly, provision is being made to do away with the automatic cut-out hangers, which will result in a great reduction in lamp outages.



TWO-LIGHT ELECTRIC POST USED IN GRANT PARK, CHICAGO

According to the Twenty-Second Annual Report of the Department of Gas and Electricity, the efficiency of the street-lighting operation was maintained at about 99.5 per cent from April 1 to December 31, 1918. During the year 1918, there were added to the system 11,528 new lights, so that the total number of lights in service at the end of the year was 55,534, compared with 34,076 at the end of 1917, or an increase of 34 per cent. By the end of the year, all arc lamps had been replaced by incandescent lamps.

The Distribution System

The Sanitary District of Chicago has been selling to the city all energy used for the system at the rate of $15 per horsepower per year. On October 28, 1918, a new contract went into effect whereby the city now pays for energy at the rate of $15 per kilowatt per year, a decrease in cost of 25.4 per cent. The cost of power for 1918 was 0.44 cents per kilowatt hour. The number of kilowatts to be paid for is based on maximum half-hour consumption for each month in each station, as determined by printometer tapes. The wattmeters for measuring the power are connected in such a way as to measure the input to each bank of transformers. The electrical energy is produced in the hydroelectric plant at the terminus of the Chicago Drainage Canal at Lockport, Ill.

Three 44,000-volt transmission lines on steel towers bring the energy to the Sanitary District distributing station, where it is reduced to 12,000 volts for distribution to the various city substations through underground cables owned by the city. The substations in which these 12,000-volt lines terminate, and from which series street-lighting circuits originate, are owned and operated by the city.

The energy is transformed in the substations from 12,000 volts to 5,950, 3,650 and 4,250 volts. The single-phase, 250-K. V. A. transformers are used for this purpose. The energy is distributed as single-phase current to the various series street-lighting circuits. Each circuit is operated through a constant-current induction regulator, which under normal operating conditions has 1,600 volts across its terminals. All street-lighting circuits leave the substations in multi-conductor cables placed in municipally owned conduit lines, breaking up into single-conductor cables for feeding underground circuits, or through pothead cable poles for feeding aerial circuits.

Lighting Standards and Lamps

The poles used to support lamps on all types of circuits have been standardized and are illustrated herewith. One hundred and sixty-five feet has been adopted as the maximum distance between poles for No. 6 W. P. wire. Malleable cast-iron brackets and cross-arms are used exclusively on recently installed work.

The standards of the Department of Gas and Electricity call for the operation of an arc lamp or its equivalent at every street intersection and at every intersection of a street with an alley, and sufficient additional lamps, so that no length of street greater than 350 feet will be without a lamp. In the business district this distance is reduced to 250 feet. Lamps on underground circuits are staggered on the two sides of the street, while the aerial circuits are installed on one side only.

In addition to the lights mentioned above, the department operates a large number of 75-watt, 100 candle-power nitrogen tungsten lamps. A submarine cable is laid in the parkway, and posts formerly used to support gas lamps are used to carry the lamp equipment, including a film cut-out. Seventy-five of these lamps are installed per mile of street, two being placed at each street intersection, one at each intersection of a street and an alley, and, in general, one lamp for each 75 lineal feet of street.

The standard for all future installations of 100-candle-power lights is an amplification of the system mentioned above. Cables are all laid in the parkway, 5,000-volt cable being used for the primary circuit, and 600-volt cable for the secondary circuit. For street and alley crossings the cable is protected by fibre conduit encased in concrete, or steel pipe which is pushed from curb to curb without disturbing the existing paving. There are 250 to 350 100-candle-power, 6.6-ampere Mazda "C" series lamps, with 110-volt film cut-out on each circuit. These lamps are operated in groups of 17 to 31 lamps for each group. Each group is connected to the secondary side of a series transformer, which operates at 6.6-ampere primary with a ratio of 1 to 1. There are usually twelve of these transformers, with their primary windings connected in series on each 5,000-volt circuit. The secondary windings of the transformers are grounded at the middle point, so that the maximum voltage from the secondary circuit to ground is cut in half, thus greatly reducing the hazard to persons coming in contact with damaged equipment. There are two sizes of transformers used for the group-lighting circuits, one for circuits of less than 23 lamps, and one for circuits of 23 to 31 lamps.

The transformers are installed in manholes usually located at the center of three or four groups, thus reducing to a minimum the number of manholes and the amount of cable required.

A new and artistic post mounted in a concrete foundation is used on all installations of these lamps. The 100-candle-power lamp is enclosed in a 14-inch spherical diffusing globe placed at the top of the post, and is about 10 feet 6 inches above the ground. There are a considerable number of street lamps rented from the Public Utilities Company by the city for street-lighting purposes in parts where there are

THE ELECTRIC GLOBES ON THIS CHICAGO STREET WERE SECURED TO FIT THE POLES FORMERLY USED FOR GAS STREET LIGHTS no facilities for operating lamps on the municipal system.

Gas and Gasoline Lighting

The department contracts for the operation and maintenance of several thousand gas and gasoline lamps in those parts of the city where electric-lighting facilities are not available. In such outlying districts, gas lamps, 65 to a mile of street, are operated. The last are the inverted-mantle type, guaranteed to produce 50-candle-power illumination and to consume not more than 3 cubic feet of gas per hour.

A small number of an ornamental type of lamps of the same rate of gas consumption and 49-candle-power guaranteed illumination are used. One hundred and eighty-eight double gas lamps have been installed on Sheridan Road. These produce 8-candle-power illumination and consume 6 cubic feet of gas per hour. The gas lamp posts are the property of the city, and the lamps are the property of the contractor.

Some gasoline lamps are used to supply temporary light needs on streets where it is not possible or practicable to install electric or gas lamps. These lamps are guaranteed to produce 50-candle-power illumination. Both posts and lamps are the property of the contractor. The gas and gasoline lamps are operated upon a schedule which aggregates a total of 3,786 hours per year.

Service is supervised by tests and periodical inspection of the lamps. Inspection of 25 per cent of all the lamps of each type is made each month, and the result is multiplied by four on the assumption that the condition of the inspected district is typical of the whole city. Deduction is then made from the contractor's monthly bill.

A small construction force is maintained by the city for the delivery, installation, occasional moving, and the removal of gas lamp posts when they have been displaced by electric lighting.

The following table shows the cash cost of gas and gasoline lighting for the year 1918:

	Gas Standard	Gas Ornamental	Gas Double Mantle Ornamental	Gasoline	Total
Average number of lamps	5,856	1,251	56	4,907	12,070
Operation by contract	$81,809.06	$18,803.67	$850.77	$214,767.56	$316,231.06
Gas	34,316.99	7,328.78	656.41	....	42,302.18
Administration and engineering	3,721.36	794.98	35.59	3,118.29	7,670.22
Total cash cost	$119,847.41	$26,927.43	$1,542.77	$217,885.85	$366,203.46
Cash cost per lamp	$20.47	$21.52	$27.55	$44.40	

Electrolysis Investigation

Electrolysis investigations in the interests of the subsurface structures of the city are performed by an investigator in the employ of the Bureau of Water Pipe Extension, under the supervision of the Department of Gas and Electricity. This work consists in the investigation of electrolytic conditions in all locations where it is believed damage from stray street railway return currents is occurring in city water-mains or lead sheaths of the city's street-lighting transmission cables or the city's fire alarm and police telephone cables.

At locations where other utilities have underground equipment and are consequently interested in the electrolytic conditions, such investigations are usually carried on in coöperation with the other companies concerned. Considerable progress has been made in reducing the feeding distances by the installation of new substations. This is important, inasmuch as it is in itself a mitigation measure.

The success of a public service utility finally resolves itself into a matter of intelligent management, for, unlike many lines of private business, its patronage is permanently assured. If, in some cases, or in many, the public does not know how to conduct business, it must, like a private individual, or a corporation, learn how. The many successful public service utilities now owned and operated by communities throughout the country indicate clearly that the people of the United States are learning how.

Publicity as a Means of Promoting Efficiency in Health Work

By B. L. Carlton, M. D.
Health Officer, Winston-Salem, N. C.

HEALTH education is not an institution of long standing in this country. It is taking us a long time to realize that health is the one great asset of a nation, and should be seriously considered. That it is being considered, nationwide, is amply proved by the campaign against tuberculosis and by the child-welfare campaign. These movements have demonstrated that curing is too slow a method of combating the evils and that better results can be obtained by intelligent care and by controlling predisposing factors—in other words, by prevention.

The kind of work which a health department can do will be that which a majority of the people wishes to have done; therefore it is incumbent upon the department to so mould the feelings and knowledge of the individuals of the community that they will give their active support to the health administration.

People get their ideas of sanitation and hygiene from various sources: from tradition, which is more often inaccurate than correct; from physicians, who too often are easy-going and do not really see that their patients get the correct viewpoint as regards personal hygiene or proper ideas of prevention; from newspapers, which should be one of the most active sources of health propaganda, but which so frequently carry patent medicine advertisements and great headline news articles concerning some drugless quack healer, nearly to the exclusion of statements of local or state departments of health; from the public schools, which are becoming more and more sources of knowledge of public health matters; and, finally, from the activities of the health department, which as a source of knowledge of public health matters, to a certain extent includes all the others mentioned. Every health officer should be a teacher, and every health department should be a school of instruction setting forth the fundamental principles upon which public health activities are based, and making clear, in language as simple as the language of the street, if necessary, just what guarding one's health means, just how it is done, and what the department proposes to do to help the individual and the community to secure and apply those things necessary to prevent disease and to further the cause of good health. Such instruction has as its objective, legislation, the necessary funds, public coöperation, and effective carrying out of the sanitary regulations.

Means of Publicity

The means at our command for such publicity or educational propaganda are legion. The newspapers constitute one of the most important means that should be used freely and sensibly. A health officer is fortunate when he can make a personal, confidential friend of the editor or a reporter for one or more of the leading newspapers of his town. The papers will generally handle willingly all items of interest coming from the department if written simply, without technical terms. Only items of interest should be handed out—and this does not mean that some of the activities of the department or that some of the items of public health matters should be purposely covered up, but that all items, even those of statistics and regular reports, should be so arranged that they will make an appeal to the public interest; that the public may be taken into the confidence of the department. Statements should be truthful and accurate and of value to the public—never should the department of health reach the point when it considers its duty to be to issue a continuous stream of bulletins, press notices, etc. Under such circumstances sooner or later untrustworthy advice or information will be given publicity. We do not have to go back very many months in our memory to recall just such circumstances, when many of the health workers of this country were issuing instructions by the yard as to means of controlling influenza—which instruction in the final analysis frequently did not bear fruit to the credit of the department.

Handbills and special bulletins may be often used to advantage if some object is to be presented to large numbers of persons quickly. For instance, as a means of announcing the opening of a clinic for tuberculosis, or a baby health station, circulars setting forth such an item could be distributed through the schools by nurses, by sanitary inspectors or by mail. Reprints of extracts from the annual report are of value, especially if setting forth some particular feature, such as the rating of dairies furnishing the milk supply, or the rating of food-handling places, or mentioning some especial need, as additional public health nurses or additional clinics. Lectures, health exhibits, motion pictures portraying health subjects, are all of educational value by being a means of instruction to those in attendance and also by calling attention to the activities of the local board.

Another means of publicity is the campaign for some special object. The anti-tuberculosis campaigns of education have been one of the chief means of progress in public health work in the United States. The effects of such a campaign are always felt in all other lines of public health work.

Not only are newspapers, handbills, posters, bulletins, lectures, motion pictures, special campaigns, means of publicity and education, but the hundred and one little things daily coming up in the department of health are to be used with the objective of publicity and education in mind. Every complaint received affords an opportunity to explain the sanitary principles involved; every case of contagious disease is a center for educating the family and neighbors; every case of contagious disease in school affords an opportunity of explaining to parents and children (our greatest asset) the methods of handling contagious disease; every daily inspection of school children is a means, and a valuable one, of publicity for the department and education for the child.

Special Publicity Work in Winston-Salem

One or two items now in use in the department in Winston-Salem may be of interest. The first is our practice of sending a circular letter of definite instructions to parents of children having contagious diseases, especially measles, diphtheria and whooping cough—and calling their especial attention to the dangers that might follow, warning particularly of tuberculosis. Another custom is that of a monthly department letter to our dairymen.

Another thing we have been doing since January 1 which is a particularly good stroke of publicity is mailing to parents of every child born a certificate of registration of that child's birth, accompanied by a letter of congratulations and a baby record book. We are getting a most wholesome response to this activity on our part: the mother is pleased that we send her baby a book and a certificate of registration bearing the gold seal of the city and a blue ribbon, and we are pleased that we are assured of her further coöperation.

Does Publicity Pay?

Does publicity as a means of efficiency pay? We think most certainly it does, and we believe the activities of our own humble department of health bear this out.

Active, persistent setting forth of the needs of the department and of how we would proceed if given the right kind of coöperation was maintained. The newspapers helped, literature from our state department and from the U. S. Public Health Service was used, motion pictures pertaining to venereal diseases were shown, slides illustrating baby clinics were shown, leaflets entitled "Save the Babies" gave a few plain, unvarnished facts; leaflets entitled "Tuberculosis in Winston-Salem" did likewise; the health officer at opportune times appeared before local organizations, including the Board of Trade, with a few facts and suggestions. The result: legislation, funds and coöperation sufficient to provide seven nurses instead of two, two baby health stations, a central milk pasturization plant, a venereal disease clinic, a tuberculosis clinic, a dental clinic for school children, a full-time medical inspector for schools, and other items in the same proportion.

Our conclusion is, that without sensible health education the health department can accomplish very little toward eradicating disease.

Acknowledgment.—From a paper read at the annual meeting of the North Carolina Health Officers Association.

Justice to Both Minority and Majority Through Proportional Representation in City Elections

By J. L. Conger, Ph. D.
Department of History, Knox College, Galesburg, Ill.

EVERY careful observer and student of municipal affairs in Illinois to-day, and, in fact, in the Middle West, is voicing an insistent demand for a greater degree of home rule: that is, freedom for cities; first, in the making of their charters; secondly, a larger degree of freedom in the matter of fiscal affairs; and, thirdly, a wider local control of public utilities. To us all this appeals as perfectly natural and legitimate. There is, however, one fear rather widespread in America to-day that is blocking this more or less legitimate movement for home rule on the part of our cities; that is a fear that home rule really means a greater capacity for viciousness or ridiculous activity by the city hall crowd. This feeling is shared not only by state legislatures and constitutional conventions, but by the most worth-while citizens of our cities.

This is a day of reforms. Everywhere there is an awakened interest in the short ballot, in non-partisan elections, in budget legislation, business management for cities, and the commission-manager form of municipal government. All these are good, but many citizens feel an imperative need for a more fundamental change. Some scheme must be evolved for increasing the confidence of all classes of citizens in the particular administration that may be operating in the city hall. When this is done, of course a second goal has been reached, for this will guarantee the appearance of a better grade of citizens in the official life of municipalities.

Representing the Majority

Many parts of the world, including much of Western Europe, have found for a generation or more that a remedy for similar abnormal conditions lies in proportional representation, or the single transferable ballot. This has worked for simplicity in election, for economy, and as a means of guaranteeing the interest, sympathy and confidence of the great majority rather than a minority of the citizens in the work of their elected administration. Moreover, it has broken down the power of a well-organized minority, demonstrated the use-

THE COUNT OF THE FIRST PROPORTIONAL REPRESENTATION ELECTION IN AMERICA, AT ASHTABULA, OHIO, IN NOVEMBER, 1915 lessness of the "boss," cured practically all the evils incidental to our direct primary, and has worked for a much larger degree of coöperation, mutual consideration and confidence than we find in municipal life.

Under this system as applied to American city life, the viciousness of the old ward line influence would be wiped out, more than half of our growing burden of election expenses would disappear, the "boss" would be transformed from a vicious manipulator of the most undesirable class of voters working in the dark to a political specialist or leader making his appeal to the intelligence rather than to the appetites, working entirely in the open and altogether legitimate in function. The plan is not by any manner of means Utopian, for it has had a very respectable experience. The experience of Ashtabula, Ohio, and Kalamazoo, Mich.,* under proportional representation charters is most enviable and stimulating. In most of our cities the city administration is fortunate if it has behind it 35 to 40 per cent of the population, whereas in Kalamazoo more than 95 per cent of the voters could feel that they had actual personal representation on the city commission. To those of us who try to see in the city manager the ideal form of city administration none can fail to see that the fundamental weakness in the Dayton scheme as at present constituted is the non-representative character of the commission, which must stand between the city manager and the public opinion.

On the basis of our old majority-minority plan of electing city councils it is inevitable that a minority, if not an actual majority, of the voters shall be opposed to the city commission and the city manager. On the basis of exact justice, proportional representation offers the only method of giving to minorities their due weight in the affairs of the city, at the same time doing no injustice to the majority. Let no one suppose that this system would deny the right of an actual majority in the city council to make decisions. But the value lies in the fact that all the considerable factions of the city would have their self-selected, instead of hand-picked, representatives at the council table, there to speak for their own folks, to deliberate with equally honest men, and, after the council had determined upon a policy, to interpret the action of the council back to their own constituents.

No one can doubt that a council made up, as all proportional representation councils must be, of representatives of all the aggressive lines of thought in a city deliberating seriously, earnestly and intelligently upon any vital action, would come finally to a practically unanimous decision. When this was accomplished there would be strong likelihood of universal acceptance of their dictum, a situation now impossible, no matter how unanimous our present-time council may be. In fact, the more unanimous an old-time city council is, the more sure are certain large elements of our life to be suspicious of a political "deal."

Proportional representation offers no miracle and no panacea. All it professes to do is to condense the life and thought of a municipality into a small group of seven, nine, eleven or more men who will be simply a faithful epitome or reflection of the larger group of citizens. Such a city council will be no worse and no better than the citizenship of the community, and this is all we can ask. But with the ease of nomination by small petition and the fact that political alignments are determined by similarity of thought rather than geographical location of a man's dormitory, it becomes evident that any set of men similarly minded cannot only easily nominate one of their kind, but if they and their fellows constitute a considerable fraction of the voters of the municipality they are sure to elect their most popular spokesman—and they are sure of doing this, even though their votes at first may be scattered among several such candidates. Thus it is seen that the principal incentive in party regularity of the partisan whip or boss is removed.

To-day we are held into unnatural alliances by the hope of half a loaf instead of a whole loaf, or by the fear that a divided following spells defeat and the elevation of an opposing candidate. All of this is removed by the Hare system of voting.

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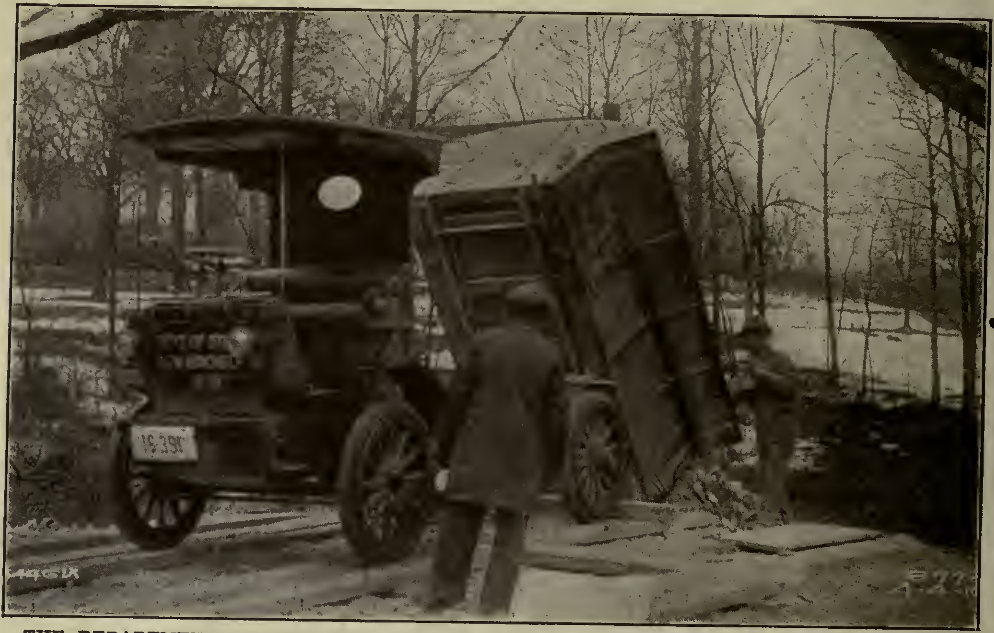
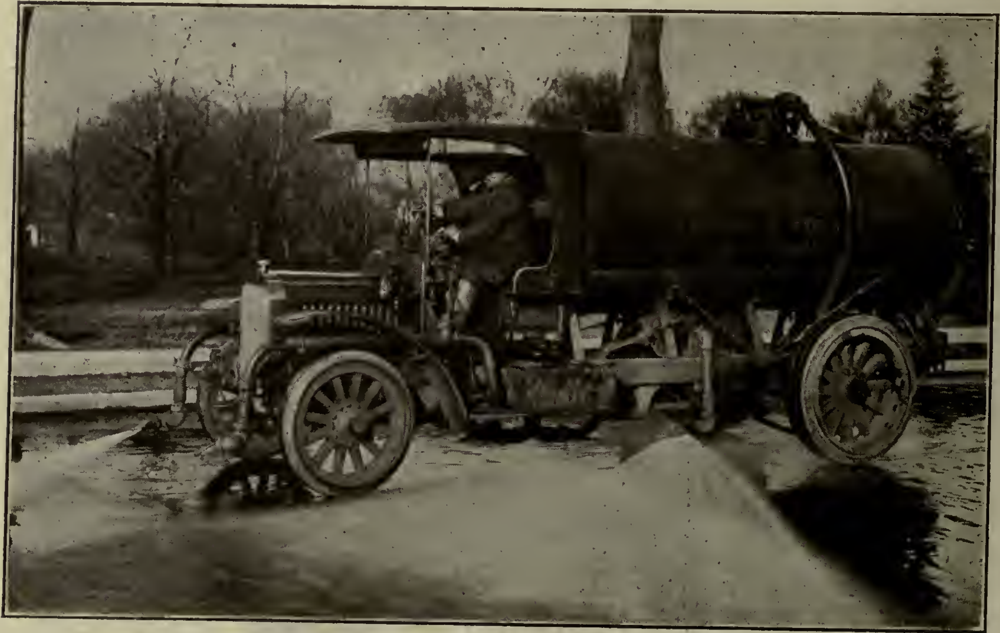
* During the fall of 1919 the Kalamazoo commission-manager charter, with its proportional representation provisions, was attacked by a former city official who had been dispossessed of his office by the new system, on the ground that the method of election was unconstitutional in that the voters were denied the right of casting their votes for all the elected city officials. This contention was upheld in a rather weak opinion by the lower court. The case has been appealed, but has not been argued on appeal as yet.

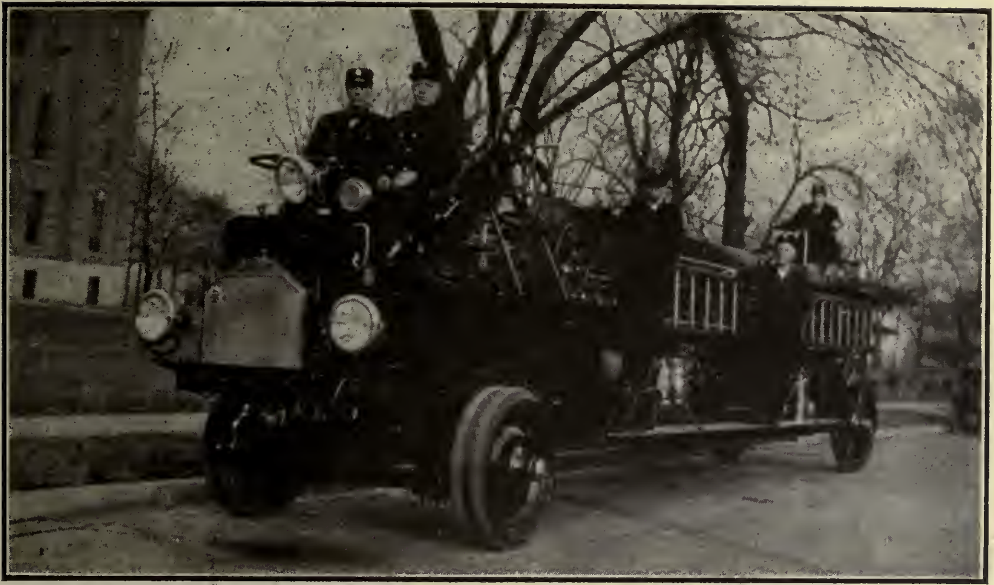
The Motor Truck Finds Its Place in Promoting Safety and Sanitation



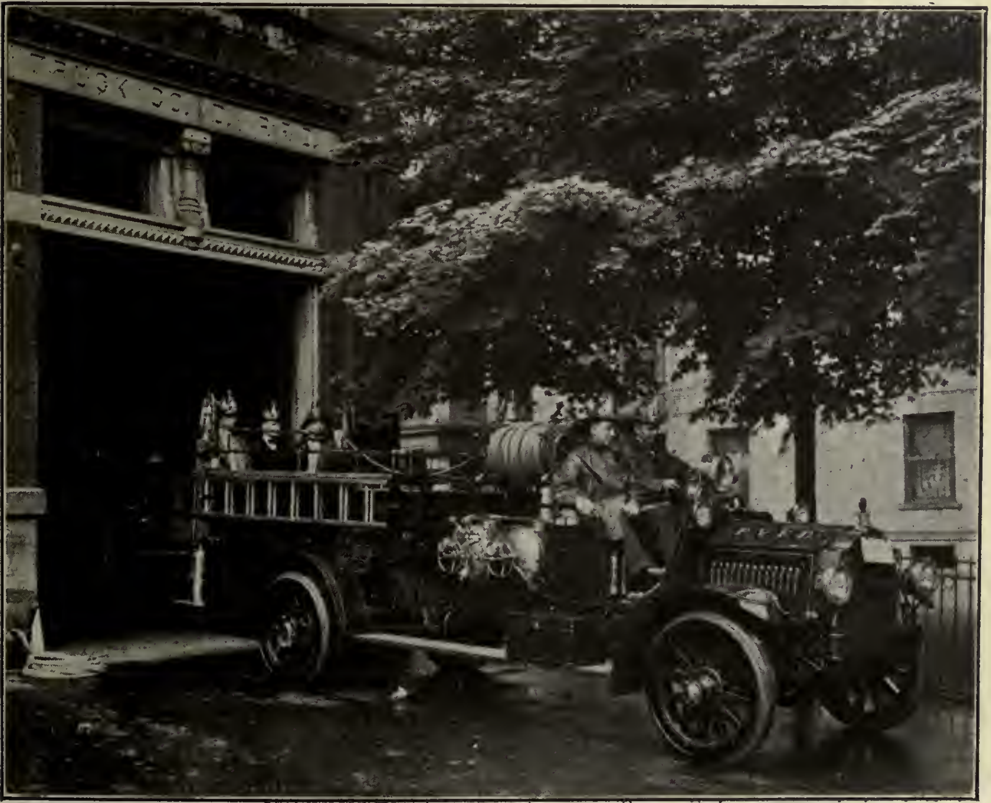
THE DEPARTMENT OF STREETS, NEW ROCHELLE, N. Y., USES THIS AUTOCAR TO HAUL RUBBISH TO THE CITY DUMP



MOTOR STREET FLUSHER USED BY THE CITY OF ALBANY, N. Y.



A HEAVY HOOK AND LADDER TRUCK MADE BY THE AMERICAN-LA FRANCE FIRE ENGINE COMPANY, IN SERVICE IN BLOOMINGTON, ILL.



A PACKARD HOSE AND CHEMICAL WAGON WHICH HAS BEEN IN SERVICE FOR A LONG PERIOD AT PARNASSUS, PA.

A Dual-Purpose Rest Room

By Sara Maynard Clark

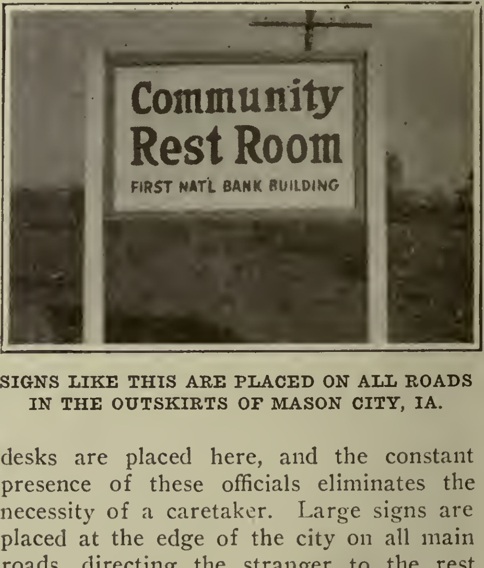
THE merchants of Mason City, Iowa, have solved the problem of a rest room to the complete satisfaction of themselves and those who are the most extensive users of such a room, the farmer and his wife. Mason City is a live town of about 20,000 population with a group of merchants who accomplish gratifying results through their Retail Merchants' Association. For some time they had coöperated with the club women of Mason City in the operation of a rest room, paying most of the expenses of the room, while the women of the various clubs supervised it. This plan was found to be costing the merchants about $150 a month. With the general rise in rents, food (for lunches were served), and matron's salary, the expenses of the rest room rapidly jumped beyond reasonable maintenance cost. So it was discontinued.

After a few months the need of a centrally located rest room became apparent. Women of the farms object to trading in a town where they must walk about the streets or stand long and tiresome hours in a store waiting to start home.

Charles H. Barber, Secretary of the Retail Merchants' Association, was the originator of the present successful plan. As the Association offices were on a side street, from one to three or four blocks out of the way for most of the merchants, Mr. Barber figured that if a suitable room could be found in a central location, a rest room and office room might be combined.

In Cerro Gordo County are twenty-three rural clubs bound together in a strong county federation. Mr. Barber approached the president of the Federated Country Clubs in regard to their coöperation with the merchants in establishing such a room, with the result that through the federation the country clubs gave suitable furniture for the room which the merchants rented.

The Community Rest Room, as it is called, is a large, light, comfortable room in the basement of the First National Bank Building, a central location at the corner of Federal Avenue and State Street. An outside stairway and elevators inside the building provide easy access to the room. Little expense was necessary to remodel the room for the purpose for which it is used. At one end a cozy nook was curtained off and furnished with a table, rocking chairs and a cot for the use of mothers and little children. In the main part of the room is a long library table covered with reading matter. Magazines are furnished by a few individuals and the librarian of the public library. Chairs are scattered about the room and grouped conveniently around the reading table. Adequate toilet rooms adjoin. At one side a space is railed off for the offices of the Retail Merchants' Association. Mr. Barber's and his assistant's desks are placed here, and the constant presence of these officials eliminates the necessity of a caretaker. Large signs are placed at the edge of the city on all main roads, directing the stranger to the rest room.



SIGNS LIKE THIS ARE PLACED ON ALL ROADS IN THE OUTSKIRTS OF MASON CITY, IA.

The yearly maintenance cost of the Community Rest Room averages about $1,100, covering rent, heat and janitor service.

The country people feel a desirable partnership in the room, for they furnished it and take a personal interest in its welfare. It also affords a headquarters for meetings of the advisory board of the Federated Country Clubs of Cerro Gordo County as well as the various committees of the federation. Here is hung the county service flag with seventy-eight stars, three of gold.

News and Ideas for Commercial and Civic Organizations

New Brunswick Plans to Become a Seaport

New Brunswick, N. J.—The old college town of New Brunswick, twelve miles from lower New York Bay, is ambitious to become a seaport, and the New Brunswick Board of Trade is responsible for a movement that may ultimately bring this about. It is an interesting story and shows what may be done by coöperation. True, the plan is only in its infancy, but it has been well thought out and is practicable, and there is therefore hope of its achievement. The city also hopes that when it becomes a seaport it may be a transfer station for the exchange of express matter from ocean liners to aeroplanes for delivery to distant cities.

In developing the commerce of the city, the Board of Trade has taken up the improvement of the Raritan River, which at present has a depth of only 10 feet. A joint committee of the Board of Trade and the City Commissioners worked out a plan for a municipal dock which will insure federal aid to deepen the channel of the river. The outgrowth of this committee's deliberations is the Raritan Terminal and Waterways Association, representing the governing and civic bodies of nine municipalities and having an affiliated membership of more than 1,200.

The active members of the chambers of commerce of the various municipalities are interested in this movement for deeper water, and coöperated with the Raritan Terminal and Waterways Association in its efforts to have incorporated into the Rivers and Harbors bill a provision for a survey and examination of the Raritan River, with a view to obtaining a deeper channel to New Brunswick, 15 feet to begin with, and ultimately 20 or 25 feet, to enable big boats to come up the river. It is expected also that at least two of the bad turns in the lower part of the river will be straightened.

The River and Harbor bill was passed last month in the closing hours of the session of Congress. This means that the survey of the Raritan River, for which the bill made provision, will be conducted. The details of the survey now rest with Colonel Sanford, the new District Engineer, whose headquarters are in New York City. Data regarding the present and prospective traffic in the Raritan River will be submitted to him by the officers of the Raritan Terminal and Waterways Association, and it is expected that the principal officers of the Association will have a conference with Colonel Sanford soon in order that he may be apprised of their interest and of the great need for deeper water to meet the requirements of commerce.

Raritan Bay is so close to New York Harbor that the establishment of a seaport at New Brunswick will greatly relieve the congestion at New York and is bound to afford means of handling shipping to much better advantage. Raritan Bay empties into lower New York Bay, where the channels are more than 21 feet deep. Above the city of Perth Amboy there is plenty of land available on both sides of the river for warehouses and landing fields that could be utilized for the storage of freight pending shipment abroad or to South America.

CONDIT S. ATKINSON,
Secretary, New Brunswick Board of Trade.

Products Shows Unite City and Country People

Minot, N. Dak.—The Minot Association of Commerce believes that one of the best ways in which to help the farmers is to inaugurate the holding of farm products shows during the winter months. During the last four years this Association has tried its hand at mid-winter fairs, summer live stock shows, poultry shows, and corn and potato shows, and all of them, with the exception of the summer live stock show, were especially effective in promoting closer relationship between the town and the rural business man. Particularly was this true with the corn and potato show held last winter. The Secretary of this Association was able to meet many of the farmers in a social way and succeeded in blotting out somewhat the unwarranted suspicion that is the cause of so much hard feeling between town and country people.

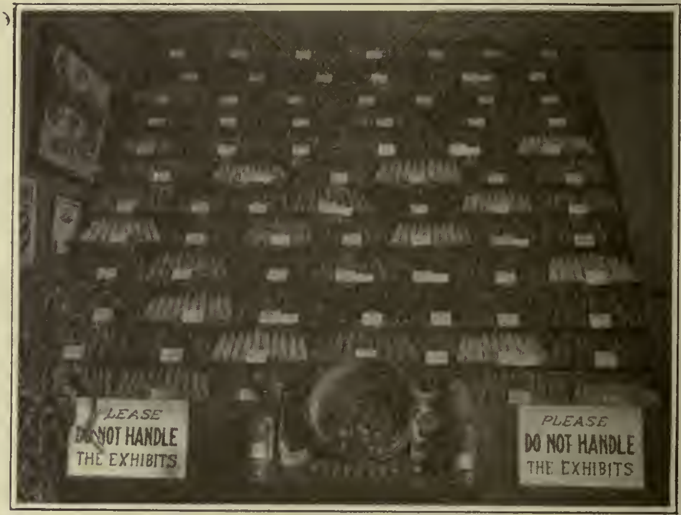
The Secretary asked for the exhibits of corn to display in the offices of the Association of Commerce after the show was over. The accompanying picture indicates how well the exhibitors responded. This exhibit is the first thing that greets the caller upon entering the Association of Commerce rooms. Each exhibit of ten ears bears a label giving the name and address of the exhibitor and the variety of corn.

This kind of exhibit serves many purposes. The exhibitors bring their friends to the office to see "their" corn; visitors from out of town invariably see the exhibit and are impressed with the resources and possibilities of the region; prospective corn planters discover where they can buy home-grown seed; and the members of the organization become interested in and advocate diversified farming, the salvation of any farming community.

The Association of Commerce is working in perfect harmony with the County Farm Bureau, and there is no doubt that in a year or so it will have proved to the farmers that its efforts to promote agriculture are sincere, and that coöperation between town and country is not only feasible, but necessary. The Association recently organized a potato-growers' association, with the object of promoting the cultivation in this region of pure standardized seed potatoes, free from disease.

All winter product shows should be accompanied with music and social features, and wherever possible, lectures upon the various products shown. The farmers are interested in lectures if they are presented in the proper atmosphere. Last winter the corn and potato growers heard lectures in the same room where the exhibits were housed. That corn and potato show was christened the "Million-Dollar Show," because the yield of those two products this year is expected to be increased that much.

In advocating winter product exhibitions, the Association of Commerce feels that county, district and state fairs are not necessarily to be discouraged, but the product shows bring the commercial organization into closer contact with the farmer than the more pretentious fairs or exhibitions, and at a time of the year when he has leisure and needs entertainment. During the summer months he is so busy producing that he has no time for either exhibitions or entertainment.


PLEASE DO NOT HANDLE THE EXHIBITS
PLEASE DO NOT HANDLE THE EXHIBITS

CORN EXHIBIT ON DISPLAY IN THE OFFICE OF THE MINOT, N. DAK., ASSOCIATION OF COMMERCE

WILL E. HOLBEIN,
Secretary, Minot Association of Commerce.

Massillon's Secretaries Meet Regularly

Massillon, Ohio.—Massillon has acquired the reputation of being one of the best-organized cities of its size in the country. This is unquestionably accounted for by the regular monthly conferences and special meetings of the Executive Secretaries Conference, which are held upon the call of the chairman. The Executive Secretaries Conference is an organization of all the paid secretaries in Massillon who devote their entire time to community work, and includes the secretaries of the Chamber of Commerce, the Y. M. C. A., the Y. W. C. A., the Salvation Army, the Red Cross, the Boy Scouts, the Social Service League, and ex-officio the president of the Ministerial Association, the Woman's Club, the visiting nurse, and the Mayor of the city.

At these conferences matters of common interest are discussed and plans are laid to prevent duplication of effort. All money-raising campaigns are passed upon, and the dates for conducting them are arranged to meet the convenience of each unit. The Conference has developed a spirit of coöperation among the secretaries and has helped to coördinate all the community activities.

"What can the Conference do to assist your organization?" is the question that is asked at each conference. The best part of the plan is that it works.

EDWIN B. LORD,
Managing Secretary, Massillon Chamber of Commerce.

The Portland, Ind., Plan of Solving the Housing Problem

PORTLAND, IND.—One method of meeting and solving the omnipresent housing problem, and perhaps one of the simplest, has been evolved and successfully carried out by the Portland Commercial Association, with the result that the congestion in Portland has been materially relieved during the past year. This method, it is believed, will be of particular interest to cities of from 5,000 to 10,000 population, where low rentals make the construction of dwellings for tenancy at the present high prices of building material a poor investment.

Portland, like all other municipalities, large and small, throughout the country, early in the spring of 1919 keenly felt the need of more dwellings, and a housing committee appointed by the Commercial Association for six months sought a building plan which would be practicable in a county seat city of 6,000 inhabitants. As rentals were from $10 to $20 monthly, it was calculated that a dwelling costing from $2,500 to $3,000 would net the builder less than 4 per cent on his investment. Hence it was decided that building houses for tenancy at the present prices of material would be impractical from a business viewpoint. The committee therefore arrived at the conclusion that if houses were to be built, they would have to be built by public-spirited citizens who had the welfare and progress of the city at heart regardless of profit.

In July, 1919, a publicity campaign was launched to awaken the citizens to a realization of the fact that before the end of the year the industries would demand 300 more employes, which would mean that more houses must be built, because the living accommodations were at that time being taxed to their limit. By the middle of August public sentiment had crystallized into a definite demand for action. A citizens' mass meeting was called, which resulted in the adoption of the following plan.

Each industrial corporation, mercantile firm and individual in the city that was considered financially able to do so was called upon, through the Commercial Association's Housing Committee, to build from one to ten houses. A total of 54 houses was pledged. These new dwellings were to be for rent, and in case of any of them were sold when completed, the owner was to use the proceeds for the construction of another house at once. In other words, each individual and firm agreed to set aside a building fund of its own to be used for the construction of dwellings as long as the city needed additional housing facilities. These individual building funds amounted to about $100,000 in the aggregate.

Thirty-four of these houses are now completed. Nine of them have been sold and the proceeds are being used to build again. Out of the remaining 20 of the original number pledged, 17 will be finished this summer. The construction, type of house, location and the actual building details were left entirely to the owners, the only requirement being that the dwellings be finished within a year and that they comply with the city building code and sanitary regulations. The houses are of the bungalow type. They range in price from $2,400 to $3,000 and contain from four to seven rooms.

It is true that the building of these 54 houses will not entirely solve the city's housing problem, but independent private home building has been stimulated by this project in the meantime, and the situation is greatly improved.

KEITH SPADE,
Secretary-Manager, Portland Commercial Association.

EDITORIAL NOTE.—See the earlier achievement of Pontiac, Mich., along this line; THE AMERICAN CITY, Sept., 1919, p. 261.

THE BUILDING OCCUPIED BY THE MAGAZINE CLUB OF HASKELL, TEX., WHICH HAS BECOME THE CITY'S COMMUNITY CENTER

Haskell Magazine Club a Wide-awake Civic Institution

Haskell, Tex.—The attractive building shown in the accompanying illustration is the recently acquired home of the Magazine Club of Haskell. This club was formed by the progressive women of Haskell eighteen years ago, before even a railroad passed through the town and when it was a tiny village surrounded by vast acres of pasture lands on which roamed Texas "Longhorns." Haskell is now a thriving little city of 3,000 inhabitants.

Besides maintaining a library as one of the features of its work, the Club has from the beginning been a potent factor in the development of Haskell and the surrounding country. It has, in fact, led almost every movement for the betterment of Haskell, and because of that fact it is often referred to as the Women's Commercial Club.

A desire for a club home or community center was born with the organization of the Magazine Club. At first a room was rented and furnished for its use; a few years later a small frame building was purchased, but this was soon outgrown. In 1917 the present home was built. It is a red brick bungalow, consisting of a reception room, the library, an assembly room, a rest room and a kitchenette, and was made possible only through the persevering and untiring efforts of the club members. The building fund was started with an initial subscription of $1,000, and the Club raised the remainder by various means. The original cost of the land and building was $4,500, but the property is now valued at $10,000.

During all these eighteen years the Club has perpetuated the library as a public institution, opening it to the public twice a week. The present building houses the library very comfortably. It is also used for meeting purposes by the other clubs in Haskell, and it is always open to the young people for their entertainments. In fact, the building is known as the community center of Haskell.

MRS. R. R. ENGLISH,
Federation Chairman, Magazine Club of Haskell, Tex.

Profitable Recreation Promoted by Albany Chamber

Albany, N. Y.—The baseball games conducted by the Twilight League in Albany last year were made possible by the good work of the Recreation Committee of the Albany Chamber of Commerce, which raised the money required to finance the League. The League was formed at the suggestion of the Commissioner of Charities, and conducted a very interesting series of baseball games, besides a number of other sports, after a plan outlined by the Commissioner. The games were played after business hours, the local daylight saving law making it possible to play them late into the evening. As a recreation measure they proved highly successful, for they held the attention of young athletes from the factories and other walks of life who might otherwise have found their recreation in other forms.

At the close of the season, more than a hundred of these young men met at the Chamber of Commerce offices one Saturday night to see the large number of beautiful medals, cups, pennants, banners and flags awarded to the winners by Mayor Watt, President Winchester and other officials.

The League has started off this year with even greater enthusiasm and much stronger support. Games are being played this year in every city park and in various fields loaned by public-spirited citizens. One of the local newspapers has offered a trip to the World's Series to the winning ball teams. Between thirty and forty men's teams and twelve girls' teams are playing baseball on a regular schedule. The League is under the direction of its president, George Elwell, who is also chairman of the Recreation Committee of the Albany Chamber of Commerce. Manager McGraw, of the New York Giants, and other prominent New York men have become enthusiastic financial supporters of the League.

ROY S. SMITH,
Executive Manager, Albany Chamber of Commerce.

Campaign for Better Dairy Cows

CONCORDIA, KANS.—A $100,000 corporation called the Cloud County Holstein-Friesian Company has been formed by the Concordia Chamber of Commerce for the purpose of demonstrating the value of breeding a higher quality of dairy cattle than has heretofore prevailed in the county. The plan is receiving the coöperation of the farmers, and the company is really a partnership arrangement between them and the city business men, the farmers holding about the same amount of stock as the city men. The par value of the stock is $100.

A herd of 200 pure-bred Holstein cows will be bought with the funds, and the cows placed with the stock-holding farmers, who will sign a contract to keep them for a period of five years. The assignment of the animals will be made by the Board of Directors of the company, which will select the farmers according to their reputed fitness to care for the animals. The farmer must hold at least two shares of stock for each animal placed on the farm.

The contract with the farmer dairymen will be made on the basis of their sharing equally in the profits. The farmer is entitled to the receipts from all the milk and cream produced by these cows, and half the value of their calves when sold. The cost of veterinary service is to be shared equally by the farmer dairymen and the company.

The plan originated with the agricultural agent of Pettis County, Mo., where it had been in operation for nearly two years when it began to attract attention, and has been copied in a number of other counties in this section. A prospectus of the Cloud County Holstein-Friesian Company outlining the plan, and a copy of the contract with the farmers, may be had by addressing the secretary of the Concordia Chamber.

CHARLES W. COLLINS,
Secretary, Concordia Chamber of Commerce.

Armory and 400 Infantrymen Secured by Commerce Body

ERIE, PA.—When the Erie Board of Commerce learned that Erie was promised an appropriation from the state for a battalion armory if the city would raise $35,000 for a site and recruit a battalion of 400 men for the Sixteenth Infantry of the Pennsylvania National Guard, it took steps at once to secure the enlistment of the required number of men. As Erie has never supported more than one company, the situation presented some difficulties, but the city needed a convention hall very badly and the Board realized that it was its duty to push the matter to a successful conclusion.

The funds were quickly secured, but it was seen early that concentrated effort would be necessary to raise the battalion of 400 men, and the Board therefore assumed entire charge of the recruiting work. The usual forms of appeal through publicity, speeches, calls and entertainments were used. As a final means of stimulating the recruiting, a request was sent to the Government asking that a regular army recruiting team be sent to Erie. A detachment of thirty men with two officers arrived with camouflaged trucks, military displays and a band, and made appeals to the men in the mills and offices, and in two weeks succeeded in completing the required enlistment and in establishing for the first time in Erie a full, four-company battalion.

H. A. DAVIDSON,
Secretary, Erie Board of Commerce.

A Campaign to Curb "Fake" Stock-Selling Companies

Holyoke, Mass.—The Holyoke Chamber of Commerce has a wide-awake Securities Investigation Committee which has embarked upon a campaign to protect the citizens of Holyoke and vicinity from being "taken in" by numerous speculative investment companies which have been operating in New England.

HAVE YOU BEEN STUNG LATELY?

Large issues of stock of questionable value have been sold to the Holyoke public and stock salesmen have pocketed enormous commissions.

Get-Rich-Quick schemes are offered by honey-tongued salesmen, who work not, neither do they spin. The wage earner, whose earnings are larger than in former times, is the principal victim.

Can you readily sell your investment or borrow money on it—that is the test.

If your investment is sound, hold on to it: but, if doubtful, before you get hooked in too deep, read in the Telegram and Transcript next week's series of educational investment advertisements, sponsored by the

HOLYOKE CHAMBER OF COMMERCE

Denny B. Goode, Secretary.
P. M. Judd, President.
John H. Woods, Chairman Securities Investigation Committee

A series of seven advertisements was prepared by the Chamber's committee, to be used in its fraud prevention campaign. The advertisements are worded so as to attract the attention of the class of people liable to be caught in the nets spread by the smooth salesmen of these companies. An attempt was made to purchase a set of advertisements that would answer the purpose, but nothing suitable could be found on the market, and the advertisements are therefore of the Chamber's own preparation. One of them is reproduced herewith. Care should be taken in the preparation of such advertisements to avoid the use of names or identifying descriptions which may invite suits for slander or libel.

The Chamber learns that although three-quarters of a million dollars was invested by Holyoke citizens in such securities within the past year, not one dollar was invested by them during the first week after the campaign had been launched, and many investors who had not completed payments on their stock are making inquiries regarding the soundness of the securities.

Enrollments for Summer School of Community Leadership

With the enrollment by July 5 of 110 students for the 1920 session of the Summer School of Community Leadership, to be held at Madison, Wis., August 16 to 27, under the auspices of the American City Bureau, attendance at previous sessions will be exceeded by a considerable number. At the corresponding period a year ago, 50 students were enrolled. Just how much the school has grown can be seen from the fact that the enrollment for its first session five years ago totalled just 15 students. Last year the attendance was 191.

The Bureau considers that it was particularly fortunate in being invited by the Regents of the University of Wisconsin to use such buildings on the campus as the needs of the Summer School might require. A determining factor in the selection of this location was the prospect of no overcrowding. Arrangements have been made with the various Greek-letter fraternities adjacent to the campus for the rental of their houses during the school session, and a caterer who handles sessions of this character in various universities during the summer months is to look after the feeding of the visitors. In all these respects the 1920 school will have a distinct advantage over previous sessions.

That a very considerable proportion of the students are planning to combine the school session with a vacation for their families can be seen from the number of requests already recorded for reservations for the wives and children.

Madison offers splendid opportunities for just such a vacation. Aside from the recreational facilities which the city itself offers, all the facilities provided to take care of the 6,000 regularly enrolled students of the university will be available to the summer school students and their families.

English City Department Does Promotional Work[*]

A CITY department doing the work of a chamber of commerce may seem strange to American readers, but in England at least one municipality coöperates with the business man in the development of the community to such an extent that an entire department of the city government is given over to the promotional work which we ordinarily associate with chambers of commerce in the United States. This is the case in Sheffield. It will be interesting, therefore, to learn how the Sheffield city government is equipped to help in promotional work.

A Development Department has been established in the town hall as "one of the public services of the city to secure the development of Sheffield as a business and commercial center; to encourage and assist the expansion of its staple industries; to secure the introduction of new industries; and to develop vacant land for factory and works purposes."

The Development Committee has nineteen members, all of whom are members of the Town Council. On the Advisory Committee of ten members are representatives of education, commercial, manufacturing and labor organizations. Ten city officials compose the Officials' Committee. There are the following subcommittees: Audit; General, including City Extensions, Civic Survey, Town Plan; Transport; Reconstruction and New Industries; Publicity. The Reconstruction and New Industries subcommittee is composed of representatives of chambers of commerce, the cutlery interests, engineering employers, the University of Sheffield, and the Federated Trades Council.

Among the objects for which the Development Department was organized are the following:

To assist in the expansion of existing industries and in the establishment of new ones

To arrange, in conjunction with the University, for a system of research which will benefit the smaller manufacturers who have not the laboratory facilities enjoyed by the great armament firms

To encourage manufacturers to rebuild out-of-date premises so as to secure better health for their workers; to extend the welfare work which did so much to ameliorate industrial conditions during the war; and to substitute gas or electrical power for steam power, where this is practicable, in order to lighten the smoke nuisance

THE WOODLAND SCENERY IN THIS PLAYGROUND IN SHEFFIELD, ENG., HAS BEEN PRESERVED, DESPITE THE FACT THAT THE WATER-POWER AFFORDED BY THE STREAM FLOWING THROUGH IT IS UTILIZED FOR MERCANTILE PURPOSES

To assist transport, housing schemes, etc., and to undertake a civic survey and town plan which will guide the development of Sheffield during the next fifty years

To fix routes for roads and to correlate every existing road with all new extensions

To fix areas in which factories may be erected, and probably to prohibit the erection of domestic houses in certain localities, and insure the development of housing extensions in relation to tram and transport routes

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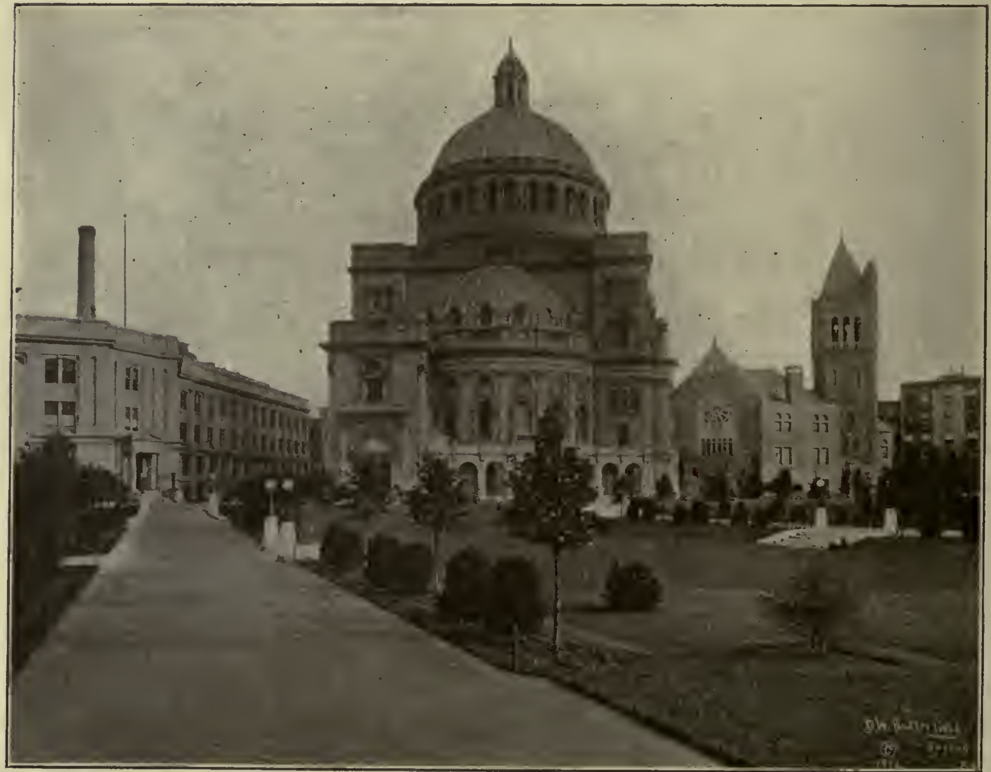
[*] EDITORIAL NOTE.—Here in America we still have chambers of commerce that think it is their duty to "fight" their city governments in order to bring about certain much desired and long overdue municipal improvements. In a rather unusual article entitled "Boards of Trade versus Boards of Assessors" which appeared in THE AMERICAN CITY in November, 1915, Charles H. Ingersoll held the conflict up to ridicule. The efficient board of trade "brings prosperity to a community by promoting municipal improvements, which in turn attract new industries, but compared to the efficiency of the board of assessors, the board of trade," to use Mr. Ingersoll's language, "has to take a back seat." The board of trade brings prosperity—the board of assessors promptly takes it away.

To clear certain slum areas and to provide children's playgrounds

The picture on page 69 shows how the Development Department has helped to preserve the sylvan beauty of one of Sheffield's playgrounds. Through this dale flows a sparkling rivulet which still affords water power to an old grinding wheel or mill, a quaint survival of ancient methods of cutlery manufacture. Although the water-power has been utilized, it has not been developed at the expense of the city's playgrounds.

One of the activities of the Development Department has been to issue a cinema film depicting the municipal, manufacturing and commercial interests of the city. Scenes are shown of public buildings and various places of interest in and around Sheffield, also of the municipally controlled commercial enterprises. Special attention has been given to the industries in the preparation of this film, a large portion of which was made available to manufacturers to display the industries in which they are engaged. The film has been taken on a tour of the world, under the auspices of chambers of commerce and the British consuls in the places visited.

How a Church Helped to Beautify a City by Increasing the Park Area



THE FIRST CHURCH OF CHRIST, SCIENTIST, BOSTON, MASS., PURCHASED LAND CONTIGUOUS TO THE CHURCH AND LAID OUT ATTRACTIVE CONVENTIONAL GARDENS PROVIDING BREATHING SPACES IN A SOMEWHAT CONGESTED PORTION OF THE CITY. VINE-COVERED TRELLISES ON THE WALLS OF BUILDINGS AT THE BORDERS OF THIS AREA ADD TO THE WEALTH OF FOLIAGE

Municipal Reference Libraries as an Aid to City Officials and Chambers of Commerce

SOCIAL and economic developments of the last few years, bringing about constantly changing conditions in the administration of municipal government, have necessitated on the part of city officials, secretaries of chambers of commerce and others upon whom devolve the conduct of civic affairs, an intensified course of study and reading to cope with the problems arising daily. More and more are these people turning to the printed page for solution of the perplexities created by the increasing demands on them in the highly specialized business of conducting municipal affairs in the most efficient manner.

To meet this situation, municipal reference libraries have been established in a number of cities, affording service of inestimable value in solving intricate problems. Special collections of books, magazines, pamphlets and documents covering every phase of municipal activity are within immediate reach, not only of city and chamber of commerce officials, but of all citizens who daily seek information on thousands of subjects. Specially trained librarians have charge of these departments, providing a maximum of service at a minimum of trouble and delay. In many other cities the same work is carried on, to a great extent at least, by public libraries, particularly through special municipal reference departments.

Facts regarding agriculture, industry and commerce; art, science and the humanities; business and the professions, are accessible for all at municipal reference libraries or through the reference departments of public libraries. Does a mayor wish to learn what action has been taken by a city a thousand or more miles away regarding the street railway problem, for instance, a telephonic message to the special librarian brings the information in detail within a few minutes. Does a prospective traveler desire to know some recondite fact as to the customs in the far East, a short conversation with the librarian puts him in possession of the information. A manufacturer wishes to learn of trade-mark regulations in some foreign land; through the same medium he is informed in a very brief time. What was the market price of lead on January 5, 1906? asks a broker, and without delay he is told. Examples without end could be given to show the immense benefit of the institution to the public at large.

Close coöperation upon the part of public libraries and municipal reference libraries with secretaries of chambers of commerce is obviously an essential to the effective working of such a clearing-house of information. Few classes of people are called upon to furnish so much diversified information as librarians and secretaries of these commercial organizations. The latter are indeed fortunate if there is a reference library in the city in which they function. So wide a range is covered in the publications in the special collections that a brief research will shed the required light on practically any question.

Municipal reference libraries undoubtedly mean a large saving in public expenditures. By including in the collections reports of special investigating commissions, documents of civic proceedings in other cities, as well as hundreds of technical books, the need of further commissions to delve into the matter at hand at considerable length and original research is obviated. It often has happened that an appointive body has proceeded to the final stages of an inquiry into certain conditions and then there has come a change in administration and the commission has been discharged. No report of what had been accomplished is left on file, and if the new administration wishes to continue the matter another commission is named and the entire field is again covered, with the resultant added expense. Whereas, had the report of the preceding commission been on file the subject could be continued from the point at which it was dropped.

As an indispensable adjunct to foreign trade the public library is coming rapidly to the fore. Both exporters and importers are employing its service advantageously.

Municipal Finance

BONDING ACCOUNTING TAXATION

SALE of municipal bonds over the city counter to the public is financing Seattle's preliminary development of power on the Skagit River, a project that will ultimately utilize 600,000 horse-power for transmission over 160,000-volt lines 110 miles in length, harnessing the mountain torrent to serve the industries of the city.

The first authorized issue of $600,000 was offered to the public June 1, and within two weeks one-third of the amount had been subscribed. A constant stream of inquiries from prospective investors indicates that the balance will be taken up rapidly.

The bonds, which bear 6 per cent interest, are in denominations of $100, $200, $500, and $1,000. The first denomination is payable in six years, maturing in ten; the second payable in eleven years and maturing in 13; the $500 bonds are payable in 13 years and mature in 15; and the $1,000 issues are 16-20's. It is the plan to retire $40,000 annually, $200,000 each being issued of the $100 and $1,000 denominations, and $100,000 each of the other two. The $1,000 bonds were practically sold out within two weeks.

This is the second time Seattle has offered public utility bonds over the counter, an issue of $60,000 having been made a little more than two years ago for extensions of the municipal car lines, prior to the transaction by which the city acquired the entire transportation system. At that time more than $200,000 was offered in subscriptions. The favorable reception of the opportunity prompted a pledge that the offering of Skagit bonds would be made direct, which is being fulfilled in the current issue.

Funds thus raised are being applied to preliminary construction on the project, including the building of 23 miles of railroad to connect the site with existing transportation lines, a sawmill with 25,000 board feet daily capacity for camp construction, and the building of a camp that will house from 400 to 500 workmen for three years or more, with especial attention to their comfort and convenience. The railroad is to be completed by the first of January next, according to schedule. A small power plant of 3,000 horse-power is to be constructed on New Harlem Creek, with an overhead of 550 feet to furnish power for work on the big plant.

The first unit will be known as the "gorge plant." It involves construction of a dam approximately 240 feet high, the water being conducted to the power-house through a 10,000-foot tunnel with a cross-section of 400 square feet. Units of 25,000 kilowatts each will be installed.

Other plants of the same size and capacity will ultimately be installed further up-stream at Diablo and Ruby. At the latter place a dam 400 feet high will impound storage equal to 1,000,000 acre feet, increasing the low-water flow from 800 to 3,200 second-feet. The head of water between the gorge plant and Ruby will be 800 feet. A total of 600,000 horse-power is to be secured from the stream after the Ruby reservoir is completed, approximately equal to the present entire development at Niagara.

The stream is located in Whatcom County within the Washington National Forest, and permit for its development has been granted to the city by the Federal Government.

In addition to this tremendous potential service, the city has already in operation a plant of 17,000 horse-power on its Cedar River site, which will be more than doubled on early completion of a new unit to utilize the power from flood waters. The water is taken from Cedar Lake, source of the city's water-supply, carried 16,000 feet through a pipe line to the power-house, and thence back to the river 12 miles below the lake. From the river the water is piped to the reservoirs within the city.

HAROLD CRARY,
Assistant Publicity Director, Seattle Chamber of Commerce, and Commercial Club.

A Rational Method of Developing a Shallow-Ground Water-Supply

The Method Applied in Witt, Ill., Should Be Used in All Investigations

By W. P. D. Warren

Miller, Holbrook, Warren & Company, Consulting Engineers. Decatur, Ill.

ONE of the most interesting and perplexing problems which an engineer is called upon to solve is that of developing a supply of water from shallow-ground wells. To the public, the big impounding reservoir, with a "visible supply of water," is a real engineering accomplishment; at times, however, it may be exactly otherwise.

The writer has given some study to the development of both impounded and well supplies and fully appreciates the necessity of the impounding reservoir under certain conditions. The plan of developing water from wells is an extremely old one, and yet one on which the best technical advice should be obtained before final plans for developing an impounding reservoir are adopted.

A Typical Problem

Witt, Ill., is a city of 3,000 population, and inasmuch as the conditions encountered there are more or less typical, it will serve to illustrate the method of developing water from shallow-ground wells, to which it is desired to call attention.

The first information given the writer at Witt was that the City Council, as a whole, wanted a visible supply of water, also that there was no chance for a well supply, as both mines in that vicinity were dry, and further that the only wells near the city were shallow and showed no promise of an adequate quality. Further investigation disclosed the fact that the engineers for the State Water Survey had been over the ground several years previously and had made a brief and valuable report. Below is an extract from the Letter of Transmittal of Paul Hansen, engineer, in which he pointed a way to the proper solution. The date of this letter is June 4, 1913:

> "At present there are no available data which would point to a successful water-supply, but it would seem worth while to prospect by means of test wells, especially toward the northeastward, at a distance of several miles, where the city of Nokomis has been very successful in securing an abundant supply of water from wells penetrating sand and gravel in the drift at a depth of about 40 feet."

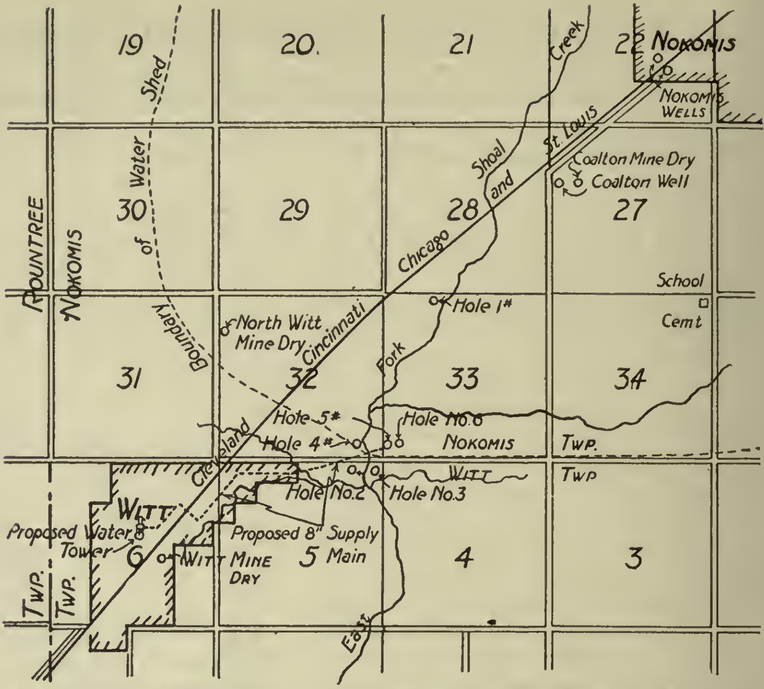
Investigation of Well Supply

In undertaking to develop a well supply, the writer was limited in the beginning by a resolution of the City Council to the effect that not more than six wells should be drilled. Investigation showed that the mine in the south part of the city and the mine about one mile north of the city were dry, and that the closest known well proposition was at Nokomis, about 4½ miles northeast of Witt. The Nokomis supply is from six 6-inch wells about 40 feet deep, the wells being driven into the drift and passing through 20 feet of soil and clay and 25 feet of coarse water-bearing sand and gravel. The gravel appeared to be of a gray or bluish color with little silt or clay in it.

It was thought that a supply for Nokomis might be located further down, in a general southwesterly direction toward Witt, but east of the closest point to the city limits by about 3,000 feet.

Drilling

The location chosen for putting down test hole number 1 was in about the center of the valley, two miles southwest of Nokomis and roughly in line with the Nokomis wells and the mine test hole one mile southwest of Nokomis, as above referred to. At a depth of 20 feet a very excellent quality of water-bearing sand and gravel was encountered and was found to be 10 feet in depth, giving a total depth of 30 feet for the well. The well driller called attention to the ease with which the well casing and drill seemed to go through this gravel deposit, and stated that the flow of the water appeared to be extremely "free." This gravel was of a grayish or bluish color.



MAP OF THE TERRITORY ADJACENT TO WITT, WHICH WAS EXPLORED FOR GROUND WATER-SUPPLY

In selecting a site for hole number 2, it was decided to choose a point on the west edge of the valley, so the hole was located within a short distance of a little branch entering the valley, and as a result considerable silt and clay were found in the sand. The sand did not run as coarse as in hole number 1, and was of a yellowish color. It was concluded that this hole was on the western edge of the deposit, for it was very similar to holes put down about that time at the mine located one mile south of Nokomis, which was known to be east of the main gravel deposit.

Hole number 3 was about 200 feet east of number 2, but showed much fine sand. Holes numbers 4 and 5, which were about 500 feet north of holes numbers 2 and 3, also showed more or less fine sand. Hole number 5, however, showed better sand, and as it lay more nearly in the center of the valley it was concluded that further drilling would locate the coarse material where the flow through the gravel would be more "free."

Considerable pressure was brought to bear at this time to induce the city officials to stop such "useless waste of money" in drilling holes out in the country and to either put down some holes in Witt, where the city owned several vacant lots, or abandon the drilling entirely. This attitude at Witt was anticipated, and was cleared up only by a careful statement of the methods being followed in the development of this supply.

The Rational Method of Determining Amount of Water Available

In the study of the problem at Witt careful search was made of available works on water-supply from wells, and only a very few authors were found who gave a clear and reasonable method of procedure for the development of a shallow-ground water-supply.

The watershed shown in the accompanying sketch made to the northeast of Witt is 20 square miles in area, a sufficient catchment area from which to secure water for a much larger city. The yield of this area is dependent upon the depth of the saturated water-bearing material. With the large number of holes put down on this area the average depth of saturated water-bearing material was found to be approximately 20 feet.

The velocity of flow is governed in a large measure by the size of the sand and gravel particles, the coarse material permitting the water to flow much more freely. The material ranged in size from fine sand to particles of gravel 1 inch in size.

The available ground storage was determined by learning the length, width and depth of the saturated water-bearing material, computing the storage in gallons on the basis of one-third the volume of sand being void space, and also on the basis that one-third the average annual rainfall, or 12 inches, was the available underground run-off.

Testing the Supply

Some authorities consider a long-continued pumping test, covering a period of several weeks or several months, as necessary. While a sparkling stream delivered from a well for several weeks will look quite convincing to many, and in fact may prove of some value in a study of the supply, it is probably more often misleading than valuable. As an illustration, assume we desire to test a well by pumping at a rate of 1,000,000 gallons per day for 30 days, also that the deposit from which the supply is furnished has a storage capacity of 60,000,000 gallons, with a somewhat limited watershed area. It is readily seen that the well might be pumped the full 30 days and appear to be strong at the end of this period, when as a matter of fact an additional 30 days' pumping would exhaust the supply. It is readily apparent, therefore, that a pumping test alone cannot be conclusive.

The pumping tests at Witt were carried on over a period of about two weeks. It was frankly stated to the officials at the time, however, that a pumping test over any considerable number of days was not necessary in view of the previous knowledge of the fundamental elements which controlled the supply. The test of the well indicated a large quantity of water available. A yield of 70 gallons a minute was secured when lowering the water level in the well about 8 feet to a depth of about 14 feet below the ground surface. The well was 6 inches in diameter, and equipped with a number 20 Cook screen, 6 feet long. With the greater area of openings in screen or greater lowering of water level a greater yield would be secured. The ground water level was lowered but a little at a distance of 20 feet from the well.

Special Features of the Witt System

The final plan at Witt was to construct a circular concrete pump house 22 feet in diameter, built over two 10-inch wells spaced 18 feet center to center, the pump house being set 10 feet in the ground in order to reduce the lift of the centrifugal pumps. There will really be only about 6 feet of lift for the pumps under present conditions, due to the level of the water in the ground.

A reinforced concrete water tank 20 feet in diameter was built on the highest point in the city. The tank is 100 feet in height, the upper 30 feet having 70,000 gallons storage capacity. Two electric pumping units have been installed, either of which has sufficient capacity to take care of normal requirements. It would probably have been a better plan to install one electric motor and one automobile-type gasoline engine as auxiliary source, each connected to a separate centrifugal pump.

Costs

The total cost of the supply system, including wells, pumping station complete with equipment, 8-inch cast iron pipe line to city limits, a distance of 3,000 feet, and the 70,000-gallon reinforced concrete water tank, was less than $25,000, or about one-fifth the estimated cost of an impounded supply.

The distribution system was let as a separate contract in 1919, and cost approximately $10,000 per mile, including valves and hydrants, the total cost of the distribution system being about $70,000 for the 7 miles. It is thus seen that the entire cost of both the supply and the distribution systems was only about 75 per cent of the estimated cost of an impounded supply alone.

Conclusion

In conclusion it is desired to direct attention to the following propositions:

1. With a saturated water-bearing material located on a catchment area of proper extent, a shallow-ground water-supply may be developed at far less expense than an impounded supply.
2. The radius of investigation for shallow-ground water-supplies should be increased so that it shall not only include the city limits but extend for a distance of 5, or possibly even 10, miles beyond the city limits, depending on local conditions and the availability of an impounded supply.
3. The quality of water secured from one test well in a valley may be entirely different from that in another well in the same general region.
4. The quantity of water available from a saturated water-bearing material should be determined for various cities and should be made a matter of public record.

The Elimination of Dust and Dirt by Street Washing

By J. T. Fetherston

Formerly Commissioner of Street Cleaning, City of New York

STREET cleaning methods during the last thirty years have undergone great changes, for two important reasons: first, a better understanding of the causes of public discomfort due to street dirt; second, the development of modern machinery for removing the cause.

Fine Dust—The Great Offender

Street refuse may be classified as follows:

1. Coarse refuse which is deposited on the pavement surface
2. Rubbish thrown on the pavement by the public in violation of ordinances
3. Fine dust caused by the grinding up of coarse refuse; building material stored on the street; cuts in the pavement; dust from chimneys, etc.

It is the third class that causes the greatest discomfort, expense and danger to the health of the public. This is due to the blowing about of particles of dust which may carry disease germs to be breathed by the people, and the settlement of dust in the houses and upon goods displayed in stores.

It is safe to say that fine dust has been the greatest single cause for recent changes in street cleaning methods. These changes have materially increased the comfort of the public and probably have been instrumental in making many economies in business.

Recent Changes in Street Cleaning Methods

Not many years ago hand sweeping and machine sweeping with horse-drawn rotary brooms were almost entirely relied upon for the cleaning of pavements. Neither of these methods removed more than the coarse material, and sprinkling was extensively used to control the fine-dust nuisance. This at best was only of temporary benefit, lasting only as long as the water remained on the pavement. On hot days the water evaporated so rapidly that its effect was evident for only a short time.

With the increase of motor vehicle traffic and the extensive building of smooth pavements, sprinkling became a fertile cause of accidents both to automobiles and horses, for wet pavements when dirty are very slippery.

In an attempt to find some method of removing the fine dust, development has proceeded along several lines: improved sweeping; pavement washing; cleaning by air movement or vacuum.

The development of better sweeping machines has mainly included an enclosed rotary broom combined with a sprinkling attachment and some scheme for automatically removing the dirt from the surface of the street and conveying it to a compartment, from which it was later dumped, either at the point of disposal or in piles upon the street.

Pavement Washing Generally Effective

The developments in pavement washing have been widespread and varied. They may be classed in three general groups: hand flushing; machine flushing; squeegeeing.

The first method, while it appears to be the most efficient, is generally more expensive than the second, because of the labor required, the larger use of water, and the limited area covered.

The second method has progressed from the horse-drawn machine using a sealed tank and depending upon air pressure to force the water through the nozzles, to a horse-drawn machine with an auxiliary gasoline engine and pump mounted at the rear, and finally to a motor-driven flusher either with an auxiliary motor and pump mounted at its rear or utilizing the truck motor to drive the pump as well as to propel the machine.

With motor-driven units it is now possible to cover large areas at a minimum of expense and with an economical use of water. It is also possible to work the equipment for sixteen or more hours per day, which means a material reduction in cost and meets the requirements of the city where the business section can be cleaned only at night but where the residential districts can be cleaned during the day.

The modern flusher will remove not only the small particles of dirt but the coarse material as well from either rough or smooth pavements and will do a better job on pavements in poor repair than can be performed by other types of apparatus. It successfully combats the fine-dust nuisance, following nature's method of cleaning with flowing water liberally applied. In the hot summer season a wet-cleaned street is a great relief, actually and psychologically.

Cleaning by Air Movement or Vacuum Still in the Development Stage

Cleaning by air movement or vacuum is a recent development and must as yet be considered only in the experimental stage. Its greatest success to date has been in naturally dry climates or in cities where the temperature in the winter goes below freezing for a considerable period, yet whose streets are generally free from snow. In other words, vacuum cleaning is used in locations where flushing is prohibited by temperature, yet where fine dust must be removed. The machines so far built have been only partially successful in cleaning rough pavements.

Generally speaking, it may be said that the air movement equipment, while successful in some communities, has so far failed to meet the demand for a machine which will be generally usable and which at the same time will successfully solve the fine-dust problem.

CONCRETE PAVEMENT ON MT. PLEASANT AVENUE, FT. THOMAS, CAMPBELL COUNTY, KENTUCKY. A GREAT IMPROVEMENT OVER DUSTY DIRT ROADS

The third method is limited to smooth pavements. Squeegeeing may be termed the mechanical scrubbing of pavements with a rotary rubber squeegee attached to a horse-drawn or a motor vehicle. A tank of water is carried which supplies the sprinkling nozzles in front of the squeegee. It has been found that squeegeeing is limited in its effective performance to smooth pavements in good repair. It is only locally applicable and has had a limited use.

At least one road engineer will get adequate compensation for his labor and skill—Texas has raised its state highway engineer to $10,000 a year. He is the highest paid of all the state officials, but who is doing more important work?

The Pageant of "The Light" Makes Clear the Duty of Any City to Its Schools

By Charles H. Lake
Assistant Superintendent of Schools, Cleveland, Ohio

WHEN the National Educational Association held its annual convention in Cleveland last February, the visiting members were given an opportunity to attend a performance of "The Light," an educational pageant written for the occasion by Miss Catherine T. Bryce. Since the initial performance, "The Light" has been presented in scores of American cities and towns and has come to be considered a distinct contribution to the field of educational literature. It is written as an allegory in which the principal character, "Any City," is shown the various stages in the learning process by the supporting character, "Education."

As the play opens, Any City is seated in his study, considering the different items on the tax budget of the city for the coming year. Settled comfortably in his easy chair, he approves item after item of the budget, hesitating only over the appropriation for the schools of the city, which he cuts down in order to avoid reducing the budgets for the other departments. With the accomplishment of the work of adjusting the budgets so that all departments, with the single exception of the schools, shall have all that is needed, Any City falls asleep, and Education, holding aloft her light, appears before him in a dream and shows him a series of pictures of the development of education through the ages. Education has had many names, and one after another they occupy his attention. Scenes depicting Experience, Tradition, Invention, Training, Discipline, The First Lesson in Democracy, The Book, Force, Training for Democracy, The Warning, and The Summation of Education's Dream, pass in succession, as Any City looks on with ever-increasing interest.

Education first shows him a typical illustration of teaching by experience. She takes him back through the ages to the time of the earliest Indian inhabitants of the earth, who learned only by bitter experience that some of the pretty fruits of the forest were not for the use of man.

Tradition is represented by women grinding corn between two stones. One of them ventures to suggest that there may be some better way to grind corn, but the others rail at her for even thinking of using anything different from the methods handed down to them in tradition.

A scene from Hiawatha in which picture writing is introduced typifies invention. Training is represented by groups of Greek boys and girls in athletic contests and dancing, and discipline by the Roman soldiers whose fortitude never wavers in the most trying crisis.

The first lesson in democracy is a scene in a feudal castle of the days of King John. A humble subject expresses a longing to have a part in the educational advantages of the time—to read the illuminated books, to play and to sing as the troubadour sings. The lord of the manor rebukes him savagely and tells him that such things are only for the nobles; but a minstrel present who has just come from the king's court tells the baron that things are no longer so, that the Magna Charta has been signed and henceforth justice shall be denied no man, be he baron or serf, and from this time on education tends toward democracy.

Force is represented by the old-time "dame school," where the bundle of switches, the dunce cap and stool, and other early methods of punishment were much in evidence.

A model school is shown in the next picture. In this school there is a well-trained teacher; the individual interests and aptitudes of the pupils are receiving consideration in the wide range of work that is being given. The equipment is good. This sort of school is made possible by liberal tax schedules and a progressive attitude on the part of the taxpayers. Miss Bryce says, through one of the characters in the pageant:

> "No sacrifice is too great for the public to make that all schools in the country may be brought to this, may be advanced beyond it. It is owing to the self-denial and patriotism of the best teachers of America that the average

SCENE FROM THE PAGEANT OF "THE LIGHT," REPRESENTING THE WAYS OF TRADITION—WOMEN GRINDING CORN

standard of her schools is as high as it is to-day; it is because of their untiring efforts that America has schools to-day beyond the price the public is paying for them.

"It is to the school children of to-day, children with a thorough education, trained to think and act for themselves, who have learned to stick to a thing until it is finished, children who are healthy and courteous and patriotic, that you must look for the controllers of the future destinies of America. Upon the training you give them now depends the fate of the nation in the years that are to come. We are at the dividing of the ways. The public must either provide the means for the democratic training of all boys and girls or permit class distinctions in citizens of a republic."

The "Warning," a contrasting picture, shows a school in which a poorly trained teacher tries to "keep school" under most distressing conditions. The schoolroom is crowded with children who have to work under such handicaps that they have no respect for the school nor their attempts at education.

The pageant closes with a summation of Education's dream. In the background are shown the past steps in education, and in the foreground the children who are the hope of America.

As the curtain goes down on the final picture, Any City awakes and, of course, revises upward the budget for the schools.

Miss Bryce is an author of considerable note, having written several elementary readers and volumes of stories for children. Until recently she has been at the head of the elementary grades in the Cleveland schools, but has now become Assistant Professor of Elementary Education in the newly established School of Education at Yale. As such, she will occupy the unique position of first woman professor in the history of Yale.

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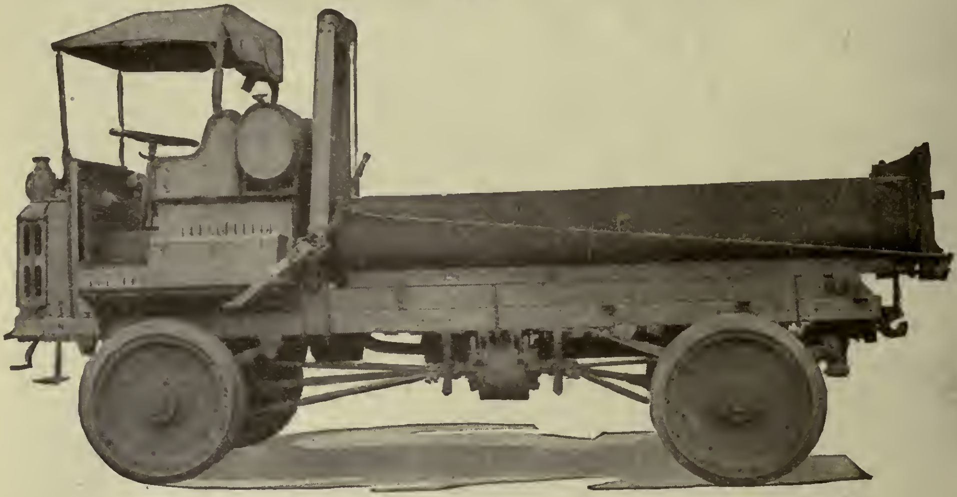

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Small-Town Problems

By Karl B. Lohmann

Town Planner, Pennsylvania State Bureau of Municipalities

TOWNS must be more than a mere collection of houses, stores and factories. They should be places in which residents can take pride and comfort, where the normal expectation is growth and development, and the proper object of such development is production of one form or another based upon healthy living conditions.

They should embrace a proper system with appropriate alignment, gradient and widths, adapted to the present and future demands of traffic. They should include parcels of land, appropriate in size and location, held in advance for the public structures that must come in the life of the town. They should give recognition of the fact that no small town can expect to clinch its hold as the recreative center of the open country or as a real home town, unless there are places of play and wholesome rest, parks and playgrounds for children and adults.

Moreover, the right sort of town requires that homes must be more than mere houses. They must be attractive and convenient in character and equipment, with adequate surroundings provided, and where the districts in which they are located are not defiled by unsightly, noisy and ill-smelling industries. Our small towns must be clean—clean in air, water and drainage—clean of obstructions on the streets, of litter, poles and wires, and billboards; clean of tin cans and ashes in the yards, and trimmed up where possible with grass, flowers, shrubs and trees. We must never forget that an unclean town cannot be wholesome, healthy and attractive until it is made sanitary and clean and green.

If in such considerations as the above we discover how far and wherein we have fallen short of the physical standard of the ideal for small towns, it devolves upon each of us to help lift to that standard the various features of the town.

That may be accomplished best if incorporated in some definite purpose or program. France recently passed a law compelling every town and village to lay out its future development according to principles of modern city planning—or, in other words, in some kind of definite program. Each of our towns might heed that wonderful example. It is entirely possible and practical for them to do so. It is merely the application of good business principles, wherein a plan or program of action is the guide.

By working together, the town council, the city commission, the chamber of commerce, the civic improvement society, or any one of several organizations, has it in its power to make important strides in the preparation of a concrete study or ideal towards which the town should move.

In small towns where a comparatively new policy is to be inaugurated, the latter is often met with a persistent prejudice and indifference that manifests itself in misunderstanding and cross-purposes within the community. The spirit will vanish when the people fully realize that the development of healthy, efficient and self-sufficing towns, according to the best modern practices, is absolutely essential to the best development of the people within such towns and indispensable to the fullest development of our country life, and that it is to the best interests of industry and production.

What an extraordinary call such possibilities for general welfare make upon our civic conscience. It opens up an immense field of possible service wherein fairness, understanding, cordiality and community spirit must flourish and opens the way toward better towns.

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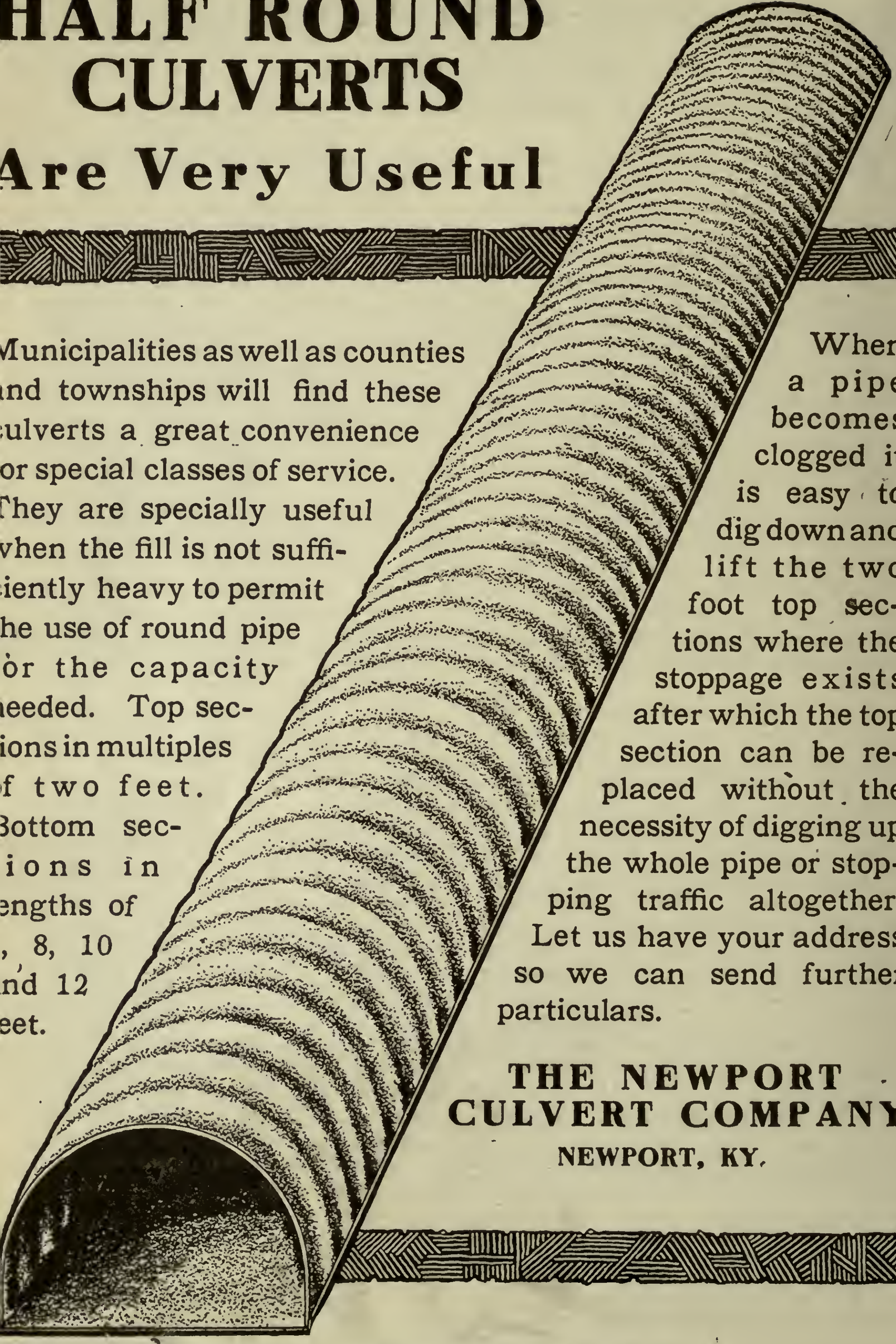

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Letting Nature Seem to Have Her Way in City Parks

The Development of Rock Creek Park, Washington, D. C.

By John B. Woods

THE latest effort to join the two largest parks in the National Capital and thus link the Potomac river front with the semi-wilderness of the Rock Creek valley promises to be successful. The problem, aside from the matters of obtaining money and condemning the necessary land, is one of redeeming a neglected and ill-appearing ravine and improving it to such a degree as to place it upon an esthetic plane with the two larger preserves. This ravine is at present given over to dumps and warehouses and a canal terminus, while the upper reaches of the same valley have long since been developed into a wonderland of forest and meadow. In the final working out of the plans for Rock Creek Park, and in the linking of it with Potomac Park and the Mall, many interesting features of engineering have been brought out, and there are several valuable points to be noted by all who are devoting time and thought to the general subject of city parks.

The Ravine as an Asset

Many of our cities are scarred with ravines and stream beds. Sometimes instead of deep-cut valleys there are muddy and marshy flats with lazy creeks or rivers meandering through. And often the general idea of those concerned is to fill up these places as soon as possible. They are objects of scorn and the cause of a considerable wave of civic shame at every election time. As a matter of fact, a deep valley, even though it be the natural receptacle of all tin cans and other cast-off material from every house within easy hauling distance, is susceptible to a type of development that makes it a positive asset to the community. There is nothing more delightful than a natural watercourse, and most ravines have streams at their bottoms, or would have them if nature were not kept from her own devices by man-made piles of rubbish.

Rock Creek Park, with its two thousand acres of wilderness, criss-crossed with bridle paths and motor roads, was formerly such a ravine, cutting the northwestern section of Washington in a north-and-south direction. But after a few years of intelligent effort the creek valley has become probably the most natural and delightful recreation spot inside the borders of any eastern city, and its makers are now looking forward to the last step in its consolidation with the other public lands. What Washington has done can be accomplished by any other city and should be attempted by every community that is blessed with usable land in the form of stream valleys or ravines.

Clearing up the Borders

One interesting result of improving such waste places is the change in building enterprises which take place along the rim of the parks. In the old days Washington was cursed with many old tumble-down shacks, perched upon the edges of the ravine. Toward the lower end of the valley there were power plants and unimportant factories of one kind and another, whose chief characteristic in common was lack of beauty either of line or coloring. But with the development of the great park a new idea came into common circulation, and people began to understand that a park was a splendid thing to have as a front yard. So building lots on the streets overlooking the park came to demand premiums in the market. New subdivisions were opened up and taken by builders. And naturally the types of houses erected upon such lots were in keeping with the enhanced values of the land. In other words, the park brought an immediate and considerable increase in property values and indirectly caused the building of better homes along its borders.

Formerly the region on the western rim of the valley was occupied by farmers and small shack owners who worked for them. But the farms have now been put into large estates or subdivided into improvement settlements, and many splendid residences overlook the wooded ravine. An incongruous

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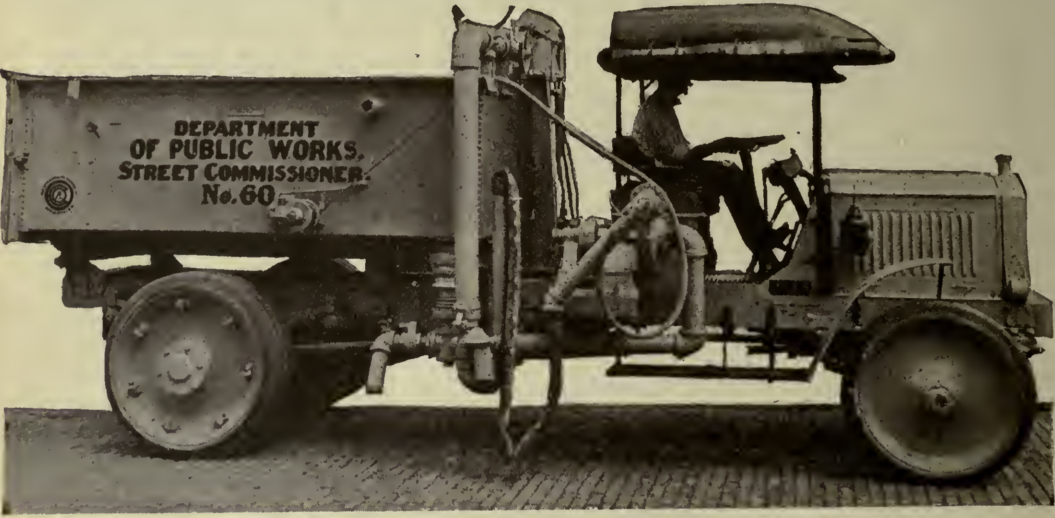

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STONE BRIDGE OVER RAPIDS IN ROCK CREEK

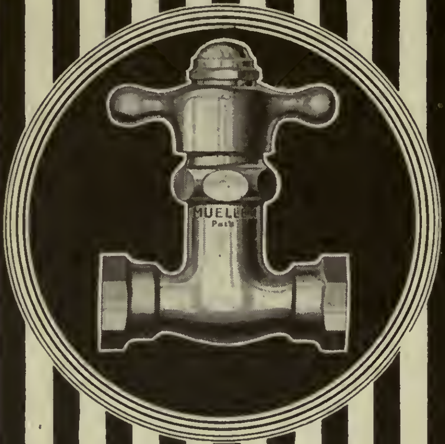
example of the general effect is found in the gas-works which squats in the midst of a newly developed exclusive residential section at the lower extremity of the valley. The gas-works has been there several years, but the fine homes have come recently as a result of the latest extension of the building of a beautiful bridge from the vicinity of Sheridan Circle.

Beauty and Convenience in the Park

Of course, there are several principal needs which a good park must meet. They may be hastily summed up as trees, grass, water, roads, bridges, and resting places. The working out of various combinations of such features is the congenial task of the park engineer, and should be a soul-satisfying labor for any man. In Rock Creek Park the stream naturally is the jewel, with its frequent rapids and occasional dam to give a pond now and again. On either side of the creek well-kept roads for motor traffic wind through narrow meadows, while bridle-paths also cross in and out. Back on either side the ground is broken in small hills which form somewhat irregular valley walls. These slopes are heavily wooded with many hardwoods and one or two of the yellow pines. Unfortunately, the chestnut blight has made serious inroads upon the chestnut trees, and a considerable work of clearing away dead trees is in prospect. In this climate, however, the other species will soon fill the vacancies left by the dying specimens.

One special feature is the National Zoological Garden, which has been joined to the main park and is open to everybody every day. Footpaths traverse the hills and cross the creek over rustic bridges, and the bridle-paths also wind about through the semi-wilderness. Hard-surfaced roads lead away toward the city and toward Connecticut Avenue, in fairly easy grades. Comfort stations have been provided in close proximity to the most favored of the picnic spots, but they are practically hidden in the woods. So well has everything been planned that a thousand automobiles, hundreds of horsemen and thousands of picnickers and pedestrians can use the park together without undue crowding.

In the development of the principal stream the effort has been made—and with success—to have wild water and rocks alternate with quiet ponds where wild ducks swim about. Stone dams have been built, and along the margins of the ponds willows have been planted. Where there are rapids the stream has been left alone, except for an occasional abutment of rock to keep the banks from washing away in time of freshets. Four fords have been built, with bridges to handle the motor and animal traffic when the water is so high as to render fording a dangerous matter. The fords have been paved with rock, and small



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dams have been laid across the stream above the fords to control the water flow. These crossing places are of peculiar interest in view of modern motoring, for the automobiles make use of them to the exclusion of all bridges when the water is favorable. In fact, they are a distinctly popular feature.

Bridges have been designed to carry out the suggestion of forest conditions. Paths are carried across the streams on rustic structures of poles and planks, and the roadways are linked with stone and concrete spans with graceful arches. The automobile roads have been planned with great skill, and several bridges have been built across the heads of tributary ravines to carry the roads out of the park on both sides. Three particularly good summit drives are provided, overlooking the woodlands below. There are several entrances on both sides of the valley, and a single criticism might be made of them. It would be more convenient for the motoring public if guiding signs were placed at all the approaches to the park instead of at only one or two. Several of these entrance roads are all but hidden in a maze of streets, and motorists often make mistakes when searching for the proper routes. There are many parks in various cities which might be rendered more accessible by guide-posts placed at considerable distances from the actual gateways.

For nature lovers it is only necessary to indicate paths; given the suggestion, they will wander back into the forest to rest and enjoy life. The problem of caring for people who prefer the grass plots and meadows is somewhat more difficult. A few shelters have been provided for such parties who may be caught by sudden showers, and rustic seats are to be found among the copses and along the banks of the stream. One good and sensible feature of the picnic equipment is the use of concrete luncheon tables, which may be kept clean even out of doors. Several springs of pure water have been made available for picnic use. Parking spaces have been prepared for cars. In brief, the picnic is an institution of the park, and the people respond by taking proper care of their papers and boxes, throwing them into the wire receptacles provided for them.

Nowadays the wilderness, if it has good roads traversing it, is more popular than formal landscape. And city parks may be converted into such wilds by simply allowing Nature to have her way. If forests can be combined with meadows, and watercourses included, the result is entirely pleasing and suits a multitude of human tastes. Any city with an unsightly ravine or swampy river meadow may consider with profit the manner of improving Rock Creek in the District of Columbia.

On the Calendar of Conventions

July 26-30.—Toronto, Ont.
International Association of Fire Engineers. Annual convention. Acting Secretary, Stephen E. Hoey, Room 1130, Municipal Building, New York City.

August 3-7—St. Thomas, Ont.
Dominion Association of Fire Chiefs. Annual convention. Secretary, Chief James Armstrong, Kingston, Ont.

August 9.—Chapel Hill, N. C.
North Carolina Commercial Secrctaries' Association. Annual meeting. Secretary L. H. Duncan, Rocky Mount, N. C.

August 10.—Portland, Ore.
American Society of Civil Engineers. Annual convention. Acting Secretary, H. S. Crocker, 33 West 39th Street, New York City.

August 16-17.—Madison, Wis.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary, Don E. Mowry, Board of Commerce, Madison, Wis.

August 17-27.—Chautauqua, N. Y.
Open Forum National Council. Summer school of open forum methods. Secretary, Harold Marshall, 359 Boyleston Street, Boston, Mass.

August 24-26.—York, Pa.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

August 25-27.—Windsor, N. S.
Union of Nova Scotia Municipalities. Annual convention. Secretary, Arthur Roberts, Town Solicitor, Bridgewater, N. S.

September 7-10.—Holyoke, Mass.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, Dedham, Mass.

September 13-16.—Los Angeles, Calif.
Pacific Coast Association of Fire Chiefs. Annual convention. Secretary, Ex-Chief H. W. Bringhurst, Seattle, Wash.

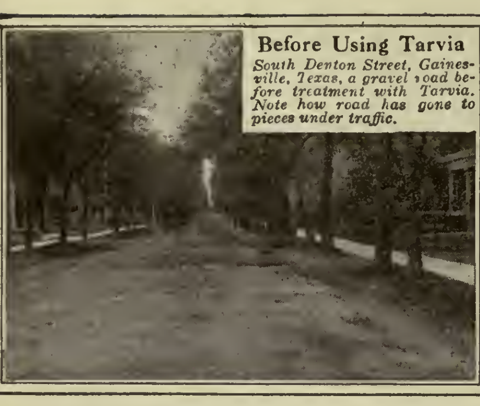
September 13-17.—San Francisco, Calif.
American Public Health Association. Annual meeting. Secretary, A. W. Hedrich, 169 Massachusetts Avenue, Boston, Mass.

September 20-23.—New Orleans, La.
Southwestern Water Works Association. Annual convention. Secretary, E. L. Fulkerson, 617 Washington Street, Waco, Tex.

October 12-15.—St. Louis, Mo.
American Society of Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, 404 Lincoln Avenue, Valparaiso, Ind.

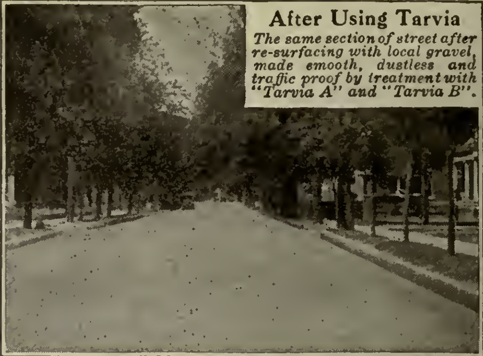
October 13-15.—Amherst, Mass.
American Civic Association. Annual convention. Secretary, E. E. Marshall, Union Trust Building, Washington, D. C.

October 16-19.—Springfield, Mass.
American Country Life Association. Annual conference. President, Kenyon L. Butterfield, Amherst, Mass.



Before Using Tarvia

South Denton Street, Gainesville, Texas, a gravel road before treatment with Tarvia. Note how road has gone to pieces under traffic.



After Using Tarvia

The same section of street after re-surfacing with local gravel, made smooth, dustless and traffic proof by treatment with "Tarvia A" and "Tarvia B".

"There are no arguments against saving what you've got"—

THE war taught us many things, not the least of which was thrift—pertinently termed "saving what you've got." Thrift showed us that last year's shoes could be resoled and that the old suit—with little mending and pressing—had another year's wear in it.

It showed many cities and towns that the policy of "saving what you've got" could be applied to their road problems. They reasoned this way:

"High costs may offer good arguments for delaying new road construction at this time, but *there are no arguments against saving what you've got.* To neglect the roads already built is waste, and *waste is a crime.*"

If your macadam roads are good, keep them good; if they're in bad shape, *repair them!*

That may mean Tarvia patching and surface-treating; the widening of narrow roads by adding Tarvia macadam shoulders, or it may mean utilizing the old macadam as the foundation for a traffic-proof Tarvia top.

Road improvements like these are not makeshift methods. They are the logical solution of the good roads problem in hundreds of communities today.

Best of all, the cost is low, the maintenance cheap and the satisfaction a blessing to the entire community.

Tarvia roads are mudless, dustless, waterproof and frost-proof. The smooth-running, durable surface resists the hardest traffic.

Our engineers will gladly consult with you, without obligation, in solving your road problems with Tarvia.

Special Service Department

In order to bring the facts before taxpayers as well as road authorities, The Barrett Company has organized a Special Service Department which keeps up to the minute on all road problems. If you will write to the nearest office regarding road conditions or problems in your vicinity, the matter will have the prompt attention of experienced engineers. This service is free for the asking. If you want *better roads* and *lower taxes*, this Department can greatly assist you.

Illustrated booklets of the various Tarvia treatments free on request.

Address nearest office.

Gravel road in Bridgeton, Maine, maintained with "Tarvia-B"

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The Roads That Bridge-Tolls Built

New Highways of Clarke County, Washington

By B. L. Dorman
Clarke County Engineer

THE first motive which prompted the county officials and good roads boosters of Clarke County, Wash., to interest themselves in intensive road improvements was to aid the county in giving employment to the hundreds of boys who had given their services to their country in the great war. This, under the conditions of our finances, was a difficult problem, and, if carried out to an extent that would be of any appreciable benefit, must of necessity tax our resources to the limit.

The assessed valuation of the county at the beginning of 1919 was about $15,000,000. According to the law we could bond the county for 5 per cent of the assessed value of the real property. In 1914 the county voted bonds for $500,000 to pay for Clarke County's share of the Columbia River interstate bridge, which spans the Columbia between Vancouver and Portland, Ore. To reimburse the county for this expenditure without taxing excessively, the toll system was established on the bridge, and the bonds were to be paid for from this revenue.

The Bridge Revenues Piled Up

The bridge was opened to traffic February 14, 1917, and in July, 1918, $50,000 was applied on the bonds. Meanwhile the traffic across the bridge increased wonderfully and the revenues accordingly. Some of the bonds could not be redeemed for more than ten years, so this meant that we must either reduce the price of tolls, allow the bond redemption funds to pile up in the treasury, or devise some way of using them.

It was suggested that we might use some of the money to pave our highways, but this suggestion brought forth many protests from those who paid heavy tolls for crossing the bridge. By the persistent efforts of the county officials and good roads boosters, however, the State Legislature of 1919 passed a bill permitting the county to use the net revenue from the bridge in construction of hard-surface pavements until June 1, 1921. It was estimated that this revenue would run from $10,000 to $15,000 per month.

There is another law whereby the county may construct paved highways under the local improvement plan; the property adjacent to the road for a distance of two miles on either side should bear 25 per cent of the cost of the improvement, the road district in which the highway is located 25 per cent, and the county at large 50 per cent. The local improvement district has ten years in which to pay its portion of the cost on the installment plan, and the district and county five years. The law also gives the County Commissioners the right to incur a bond issue for 3 per cent of the assessed value of the county, to apply under the provisions of this act.

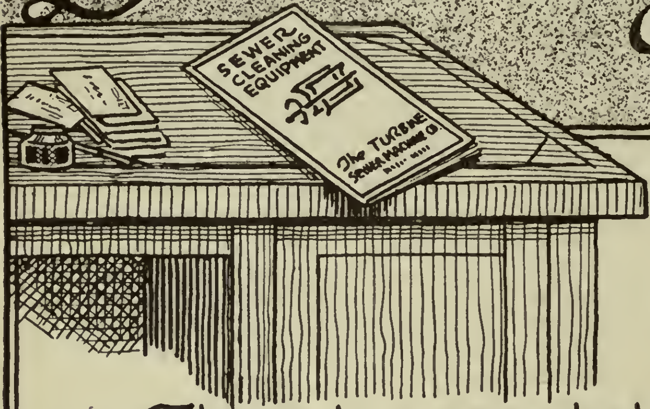
We began with a little talk and a few newspaper articles on "How we might get out of the mud." Within two months there were petitions filed with the County Commissioners for more roads than we could build in two years. Our allotment of Federal Aid funds for the years 1919 and 1920 was $336,700. We promptly matched it with our interstate bridge funds, for which we have completed and under contract 18 miles of hard-surface pavement. We have also contracted this year for 27 miles of hard-surface pavement at a cost of $658,900 under the local improvement plan.

Details of the Work

Two projects are under contract with the state, county and Federal Aid funds: The North Bank Highway, (sometimes known as the Evergreen Highway) from Vancouver to Camas, and the Pacific Highway from Salmon Creek to Pioneer. The construction on each of these projects is concrete pavement 20 feet in width with an average thickness of 6¾ inches, being 6 inches on the edges and 7½ inches in the center.

The gravel and sand for these roads is taken either from the Columbia River or from Salmon Creek, which crosses the Pacific Highway. Gravel from the Colum-

Did you get yours yet?
What?



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THIS seventy-two page book including dozens of photographs will be sent free of charge to all those interested in sewer cleaning work. The problem of sewer cleaning is one which confronts the people of every city. The Turbine Sewer Cleaning Machine has effectively solved the problem. It makes little difference how severely clogged a sewer may be——the Turbine will clean and scour it and make it like new. Our work is guaranteed—you take no chances.

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195 ELEVENTH ST. MILWAUKEE, WIS.

bia River has only to be screened to be ready for use, but that taken from Salmon Creek must be washed and screened. Columbia River sand of a splendid quality is available at many points along the stream, and is taken from the river with clam-shell diggers, loaded onto scows and delivered at almost any convenient place along the river.

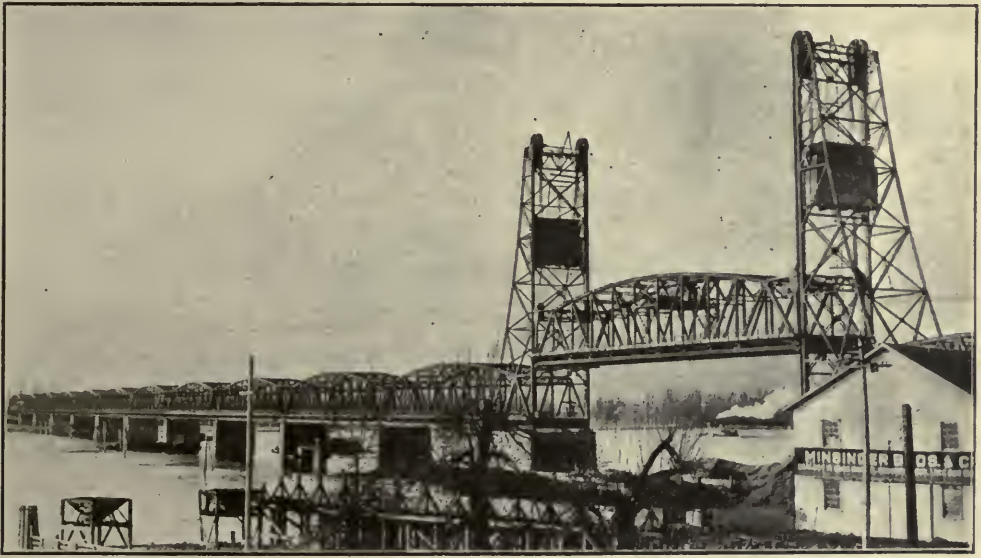
The construction of the road on the North Bank Highway necessitated the expenditure of a considerable amount of money. The old road-bed was from 16 to 20 feet in width and had many unnecessary steep grades and sharp curves, besides two grade crossings over the North Bank Railroad. We have entirely eliminated the grade crossings, reduced the grade of the road to a maximum of 5 per cent, and with one exception the greatest degree of curvature is 10.

Running along the bank of the river, as the road does, this work required about 55,000 cubic yards of excavation, and the same amount, practically in embankment, over a distance of 9 miles. This stretch of pavement, when completed, will comprise the first link of hard surface on the North Bank Highway, which parallels the famous Columbia River Highway on the Oregon shore for about 100 miles and then breaks over the great wheat fields of Klickitat County, across the Simcoe Mountains and into the wonderful valley and city of Yakima.

Paving on the Pacific Highway stretch is of a much easier nature, as the heavy work of construction has been completed for a number of years, and the dangers of slides, settlements and washouts have thereby been eliminated.

All the pavements laid under the local improvement plan have been of bituminous construction. There were three types used in this work. Where it was possible to make use of an old macadam road, the specifications called for the reworking of the old macadam into the desired shape and width for the pavement, and the addition of enough extra broken stone or rock to make a dense foundation of at least 6 inches of thoroughly compact material. Upon this was laid the previously mixed bituminous material to a depth of 2 inches after compression. In this country, where the supply of basalt rock and gravel is almost unlimited, we have quite a large mileage of this kind of road.

On newly constructed roads, however, or roads where the old macadam was not of a suitable nature to permit the use of the redress process, our specifications call for a new crushed rock base of not less than 4 inches after being thoroughly compact, or a



THE NEW INTERSTATE BRIDGE AT VANCOUVER, WASH., THE TOLLS FROM WHICH FINANCED THE COUNTY'S ROAD CONSTRUCTION

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You realize that almost all fires are due to carelessness, and a large percentage of this loss from fire is caused by inefficient, dangerous methods of storing gasoline?

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Since 1885 there has never, to our knowledge, been a fire or explosion traceable to Bowser equipment. Bowser tanks bear the Underwriters' label.

We invite you to visit our exhibit to be held at the Fire Chiefs' Convention in Toronto, July 26 to 30th. Our representatives will be on hand and will explain our equipment in detail.

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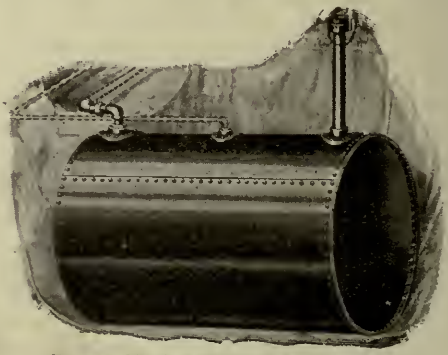

Bowser Tank is Built Fire Proof and Can't Explode bituminous mixed gravel base of not less than 3 inches, and the wearing course of 2 inches.

In the latter two classes of pavement, local conditions usually enter into competition. In some localities there are no basalt rock quarries, and the streams afford a considerable amount of gravel. In such localities the bituminous mixed gravel pavements were used, as a considerable saving could be made by the use of local material.

In all these improvements particular attention was paid to alignment and grades. Where it was difficult to make the alignment and grade harmonize, preference was given to the alignment. All curves were reduced to the least possible degree, and in many instances extra right of way was secured to get the desired result; as in the case of a right-angle turn in the road, we held the curve to a minimum radius of 120 feet, thereby pulling the new grade entirely off the old road and placing it on newly acquired right of way on the adjacent property.

The pavement on all curves of one degree and greater was made flat in cross-section, and superelevated at least 8 inches and greater according to the degree of curvature; besides, the pavement on all curves was widened from 2 to 6 feet at the center, the widening being carried out at either end of the curve. The pavements on all the county highways are 16 feet in width, with earth or gravel shoulders from 3 to 4 feet in width, according to the importance of the road.

We have found that it is particularly important to keep the road-bed for a hard-surface pavement as much above the elevation of the sides of the road as possible in order to secure the most efficient results in keeping the subgrade dry, and thereby insure the least possible danger from damage to the pavement.

In the construction of the foundation for a pavement, engineers usually try to follow a rule of making the quantities in excavation equal as nearly as possible the quantities in embankment, in order to save the loss of waste material, and borrow for the fills. This rule should not be adhered to in wet climates. It is better, if possible, to spend more money on the subgrade by filling the low places with material from borrow-pits or the ditches along the sides of the road, provided no ditches or pits are left that are dangerous to traffic.

Work Under the Local Improvement Plan

On improvements made under the local improvement plan, the amount assessed to the abutting property is fixed by a board of appraisers who are appointed by the County Commissioners. The appraisers must be residents of the county, but living outside of the improvement district. They are required to view each tract of land in the district and make the assessments against the property according to the benefits derived from the improvement. As no other fixed rule is made in the law, much of the work of a proper equalization of the assessments is left to the judgment of the appraisers. The physical features of the district must be taken into consideration in making the assessments, and in a locality cut by streams and rugged country much of the territory is benefited little, if any, by the improvement, thereby placing the burden of the assessment more heavily upon the portion more directly benefited.

In one of the more ideal districts where the length of the road improved was 12 miles, the district was divided into eight zones of one-fourth mile in width, each zone lying parallel to the road being improved. The rate of assessment per acre was fixed at $5.50 for the first zone, $4.25 for the second, then $3.00, $2.00, $1.25, 75 cents, 50 cents and 25 cents respectively. In addition to this, where a small unincorporated town or trading center was situated along the road and the land was platted into small lots for residence or business property, the assessment was made much higher per acre than elsewhere.

Summing up the assessment under this plan gave the appraisers an amount of about 5 per cent in excess of that required. This amount of surplus funds was used to relieve assessments in parts where for obvious reasons the property was benefited little or not at all.

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CHICAGO

How a City Welcomes Motor Tourists

By Charles A. Simmons

Manager Western District, American City Bureau

As each touring season sets a new mark for the number of automobile parties motoring throughout the length and breadth of the land, cities are giving increasing attention to the subject of catering to the needs and comforts of these visitors within their gates. So it is that the number of tracts of land set aside as free camping grounds for motorists is constantly increasing.

Depending upon the attention which has been given the subject, these parcels of land represent, to some degree, the warmth of the invitation which the city extends. Some of the parks are merely pieces of land otherwise unused, with no facilities and little attractiveness; few efforts are made tending to improvement. Weeds and boulders, lack of potable water, absence of firewood or other means of providing comfort, are conspicuous features. The approaches are ofttimes unhandy, or even dangerous.

Other cities have shown more consideration for these visitors, coming, as they are, in increasing thousands, and attempt to make the stay one to be remembered, so that there may be passed on to others good words for the city which has thus shown its hospitality. These itinerant guests sometimes take with them more visible evidences of their appreciation, in the form of merchandise purchased in retail establishments.

SHELTER IN AUTO PARK IN MARYSVILLE, CALIF., IN USE BY A TOURING PARTY

Provision is made for swinging hammocks. Well-kept grounds with green plots and shrubbery are an invitation to tarry. Merchants profit by the patronage of establishments listed in a bulletin of donors to the cost of construction

Many western cities have shown special activity in preparation for the coming season's avalanche of families out to "see their own country." All signs indicate that touring in the season of 1920 will be unusually heavy, and alert civic-commercial organizations have given the subject special attention. This is especially true in places through which much of the interstate or transcontinental traffic is naturally routed, and which realize they should not disregard the strangers within their borders.

The city of Marysville, in northern California, is one of the places that have placed a high value on the extension of courtesy to tourists. A centrally located plot of

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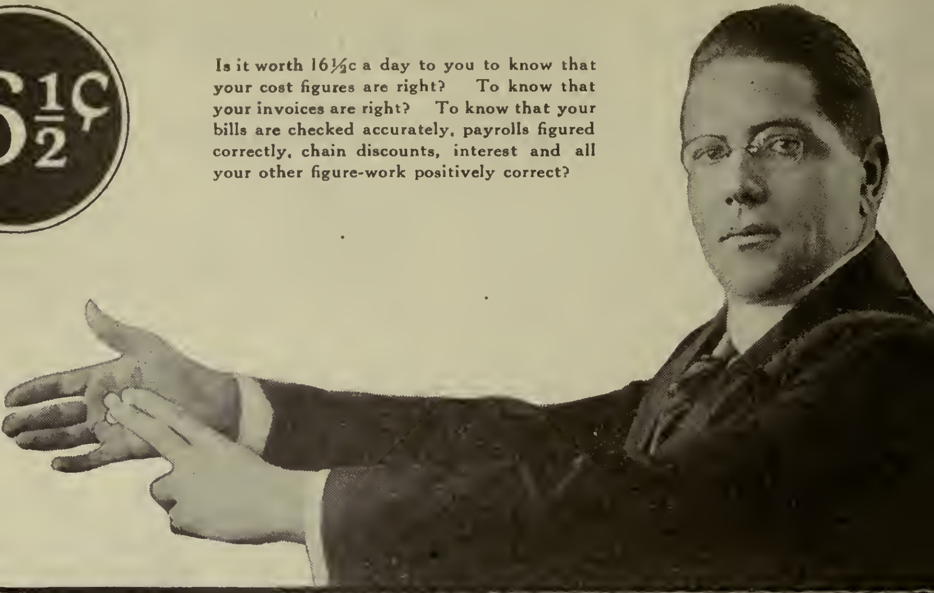
Is it worth 16½c a day to you to know that your cost figures are right? To know that your invoices are right? To know that your bills are checked accurately, payrolls figured correctly, chain discounts, interest and all your other figure-work positively correct?



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ground has been set aside for auto camping parties, and there they find equipment which induces many of them to remain for periods of several days.

The park is located within the city limits, and main arteries of travel are posted liberally with directions for reaching it. There are twelve shelter houses, each suitable for one party. They are equipped with quarter gas meters which work if one has the necessary coin. There are water hydrants and garbage and waste paper receptacles. There is a water hopper at every third shelter. Another convenience is a "service house" which contains a large central room in which are several writing tables. It has a free telephone and several shower baths and is provided with comfort facilities. A register on a writing shelf near the entrance invites the signatures of those who use the park. It is ruled to carry entries showing the names of the members of each party, and the destination and make of car. There is a column for criticism or suggestions offered.

One thousand eight hundred and sixty-seven motor parties from nearly three hundred cities, registered at this park last season. Uniformly favorable comment by these visitors on Marysville's thoughtfulness to her guests is an indication of appreciation. Occasionally a constructive criticism has been written in the register, and the Marysville Chamber of Commerce has capitalized several practical suggestions.

Trees, shrubbery and flowers lend beauty to the surroundings. The plan for the park follows suggestions made by Professor J. W. Gregg, of the University of California. The roadways are of gravel. A gardener, with police authority, is in attendance. His service is paid for by the city. The park is electrically lighted.

For those cities which are contemplating plans for a motor park, the means of promotion used in Marysville may be interesting. A full city block was given by the city and the county. Local organizations, among which the Chamber of Commerce was prominent, contributed to its support. The Women's Civic Improvement League gave financial assistance toward a fund for shrubbery and trees. Material used in the construction of shelters and the service house was provided by local dealers at cost, and labor was contributed by labor unions. The total amount expended upon equipment was $2,500.

So satisfied are the people of Marysville that this park is a practical asset to the community, that a score of additional shelter houses will be constructed. Swings for children will be put in place, and a tennis court is to be laid out.

Leading merchants in Marysville have admitted that there have been practical returns to them from the advertising directory which appears upon the walls of the service house.

In the wonderfully rich and fertile valley of the Sacramento, motorists bound on long trips have been for some time in evidence. Roads are good, weather is pleasant, and the scenery of northern California affords a constant succession of surprises. Not far from the city are the Marysville Buttes, something of a curiosity from a geological standpoint; not far distant are Oroville and Grass Valley and other places associated with Bret Harte's stories of the gold-crazed days of a little more than half a century ago. Travelers in this region find many things to interest them. Some are enroute to Lake Tahoe, others to see Lassen's smoking peak and Mt. Shasta's snow-capped summit. From whatever direction they come, sojourners in the Marysville auto park have words of praise for the city that has planned with a view to the comfort of its itinerant motoring guests.

Auto Parks in Other Western Cities

Several cities in Montana maintain auto parks. Bozeman has had one for three years, containing a two-room service building. Missoula is just finishing a new park for travelers, equipped with stoves, benches and telephone service. Helena's records show that 10,981 cars stopped at its auto park last season.

The state of Washington contains a number of new camping grounds. Spokane has just opened one near Coeur d'Alene Park; it has shower baths for men and women, electric lights, slot-meter gas stoves, open hearths, and other provisions for comfort. Walla Walla has a 7-acre tourist park, and Ellensburg has purchased 30 acres for the purpose. Pasco takes care of tourists in a park opposite its court

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Conducted by A. L. H. Street, Attorney at Law

Powers of City Councils

A decision of the South Carolina Supreme Court holds that, subject to constitutional and charter limitations, it is the business of a city council, and not the privilege of citizens, to determine what is best to be done with regard to municipal affairs. The discretion is vested in the council by law, and that body is not to be controlled in its exercise by the citizens—and not even by the courts—provided that the council action is within the law; and it will always be assumed that the council has acted within its authority until the contrary is made to appear.

But when the council does exceed its authority by acting in violation of a valid statute, or in pursuance of an unconstitutional one, every person dealing with the city under such excess of authority does so at his own risk. And, finding that the city council in this case did exceed its authority, by acting under a void statute, the court holds that, a statute purporting to authorize a city to issue bonds for the purchase of fire apparatus, thereby increasing the bonded indebtedness of the municipality without a vote of the people in violation of the state constitution, being void, a taxpayer was entitled to enjoin issuance of such bonds. (Stone vs. City Council of City of Greenville, 102 Southwestern Reporter, 755.)

Control of Street Car Fares

The authority in the Railroad Commissioners of the State of Florida to prescribe street car fares for the Pensacola Electric Company is sustained by the Florida Supreme Court in the case of State vs. Railroad Commissioners, 84 Southern Reporter, 444. It is decided that a statute of the state which gives to the Railroad Commissioners authority "to make reasonable and just rates of freight and passenger tariffs to be observed by all railroads, railroad companies and common carriers doing business in this state," comprehends street railroads.

In the course of its opinion the Court says:

"Independently of a right to regulate and control the rates to be charged for public service reserved in a grant of a franchise or right to use the city streets, a city or other municipality has no power to regulate the rates to be charged by public service corporations in the absence of express or plain legislative authority to do so. Nor does such authority arise from the power to regulate the opening and use of streets, nor from a grant of the general right to control and regulate the right to erect works in the streets of the city.

"Where it is doubtful whether a statute authorizes a municipality to fix rates for a public utility company, such doubt must be resolved against the authority of the city.

"Even if authority is by statute given to a municipality to fix rates for a public service corporation operating therein, such authority is subject to legislative control.

"Any contract ordinance passed by the city with statutory authority fixing by agreement street car fares, as an incident to the granting of franchises to a street railroad company, is subject to legislative control."

Mistaken Assessment Computations

A city council's record of proceedings taken in the establishment of a drainage district must be taken as the only evidence of such proceedings until and unless corrected or amended by appropriate procedure. The fact of the establishment of a district and its identity can be judicially ascertained only through such records.

The fact that an assessment of benefits on account of the establishment of a drainage district may have been rested on a false basis, or upon a mistaken computation, will not warrant the setting aside of the assess-

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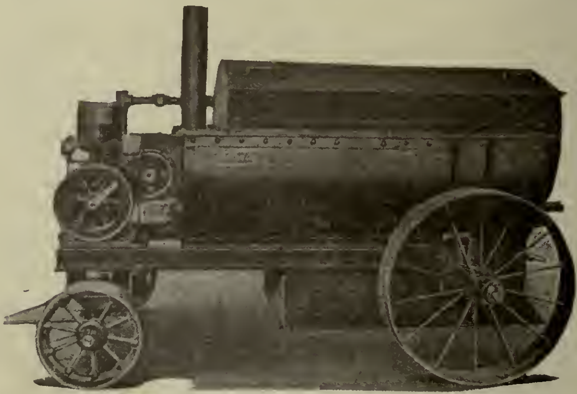

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ment, if it appears that the amount assessed does not exceed a just amount. (Iowa Supreme Court, Appeal of McLain, 176 Northwestern Reporter, 817.)

License Taxes Against Auctioneers

An ordinance of the town of Hendersonville, N. C., specifies among the privilege taxes levied upon the business, trades, and professions operated within the city of Hendersonville, that "every person, firm or corporation engaged in the business of selling any kind of merchandise, at auction, within the corporate limits of the city of Hendersonville, whether said business is conducted within or without buildings, shall pay a license or privilege tax of $400." This regulation is upheld by the North Carolina Supreme Court in the case of State vs. Razook, 103 Southeastern Reporter, 67, in which it is decided that although the municipality was not empowered to place a license or occupation tax so high as to amount to a prohibition of doing business, it cannot be said that $400 was an unreasonably high fee. And it is further decided that the ordinance was not invalid as being discriminatory merely because there was only one person in town whose principal business was that of auctioning goods, nor because the ordinance excepts a person selling his own goods not more than one day in six months. Incidentally it is declared that one prosecuted under a city ordinance of which he had personal notice served upon him, cannot complain that it was not printed and published as required by city charter.

What Constitutes "Public Utilities"

A section of the Oklahoma constitution reads:

> "Any incorporated city or town in this state may, by a majority of the qualified property tax-paying voters of such city or town, voting at an election to be held for that purpose, be allowed to become indebted in a larger amount than that specified in section twenty-six, for the purpose of purchasing or constructing public utilities, or for repairing the same, to be owned exclusively by such city."

Interpreting this provision in the case of Denton vs. City of Sapulpa, 189 Pacific Reporter, 532, the Oklahoma Supreme Court holds that the words "public utilities" embrace a cemetery to be acquired and controlled by a city and open to use by the public under reasonable regulations for the burial of the dead.

In the course of its opinion the Court says:

> "This court has had frequent occasion to consider the meaning of the words 'public utilities,' and to decide what constitutes a public utility within the meaning of the provisions of the constitution; this court having held that such public conveniences and necessities as sewers, a convention hall, public parks, and fire stations and equipment came within the embrace of the term 'public utilities.' * * * These cases indicate the weight and consideration given by this court to the elements of public safety, health, comfort, and public control, as such elements may affect and determine whether such utilities constitute a public utility; but this court has also defined these words in a more general sense, as is stated in State ex rel. Manhattan Const. Co., v. Barnes, supra, where it is said:
>
> "'The term "public utility," as used in this section of the constitution, was before this court for construction in State v. Miller, 21 Okl. 448, 96 Pac. 747. In that case it was held that sewers are public utilities, within the meaning of the term as used in the constitution, and Valley City Salt Co. v. Brown, 7 W. Va. 191, in which the term "public utility" is construed as being synonymous with "public use," was cited with approval.'
>
> "The meaning of the term 'public use' is then given careful consideration. Accepting this application of the words 'public utility' we are not without authority, for it was said in Evergreen Cemetery Association v. City of New Haven, 43 Conn. 234, 21 Am. Rep. 643:
>
> "'The use of land for a burying ground is a public use, and, for such a purpose, it may be taken, if need be, under the right of eminent domain.'"

Unreasonable Water Pipe Assessments

While the necessity, character and extent of a public improvement are committed to the judgment of a city council, it is a question for determination by a court as to whether that judgment has been exercised in a reasonable manner, and if, in view of the circumstances and surrounding conditions, the ordinance is unreasonable, unjust and oppressive, it is the duty of the court to declare it void. Hence it is held that an ordinance of the city of Chicago ordering the construction of a water-supply pipe on an isolated street in a sparsely populated district without access to industries or con-

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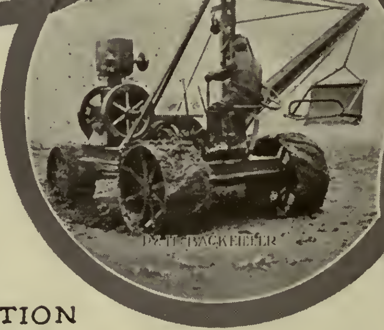

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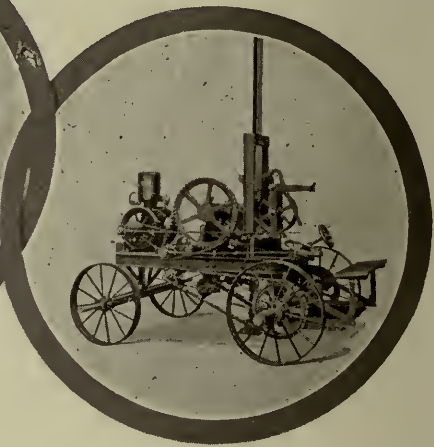

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venient transportation, largely at the expense of vacant property not in demand, and for which no demand will be created by the construction of the improvement until there is a prospect of better facilities for transportation, is unreasonable and oppressive. (Illinois Supreme Court, City of Chicago vs. Municipal Engineering & Contracting Co., 127 Northeastern Reporter, 65.)

Municipal Milk Regulation Upheld

An ordinance of the city of Charlotte, N. C., the validity of which is upheld in the recent case of State vs. Kirkpatrick, 103 Southeastern Reporter, 65, provides:

> "No person, firm or corporation shall engage in the sale, handling or distribution or production of milk for sale in the city of Charlotte, nor shall any person ship any milk into the city of Charlotte, until he has obtained a permit therefor from the health authorities of said city. This permit shall be renewed on or before the first day of July in each year, and may be suspended or revoked at any time for cause. Each person applying for a permit shall pay to the city tax collector the sum of $1 for each renewal thereof."

The Supreme Court holds that the regulation is not invalid by reason of its containing no provision for an appeal from any action of the health authorities, since if there is any arbitrary action it may be shown as defense on an indictment, or on application for mandamus, or in an action for damages.

It is further held that the ordinance, requiring people selling milk to obtain a permit and pay license fee, but providing that nothing should be construed to prevent the owner of two cows from disposing of his surplus milk, "provided such milk is not peddled or vended," and that a provision in the ordinance subjecting a party violating it to a penalty of $10 should not apply to any person owning not more than two cows, was not discriminatory, since the owner of not more than two cows would have to pay a license fee if he sold milk.

And it is also decided that one who has never applied for a permit has no standing to complain of on arbitrary power of the health authorities under such ordinance.

Electric Franchise Not Exclusive

A grant of the right to use the streets of a town for the distribution of electric current was not rendered exclusive by a provision therein that the town thereby warranted that it would provide for the full and free use of its streets, lanes, etc. Grants of rights and privileges by a state or municipality are strictly construed, and whatever is not unequivocally granted is withheld, nothing passing by implication. (United States Supreme Court, Piedmont Power & Light Company vs. Town of Graham, 40 Supreme Court Reporter, 453.)

Municipality's Liability for Personal Injury

An employe in charge of a municipal electric power plant was without authority to invite persons to enter the premises for purposes personal to himself, and therefore the municipality is not liable for injuries sustained by such an invitee on account of any dangerous condition existing in the plant.

A village is under no obligation to keep its power plant in a safe condition for the benefit of trespassers, intruders, idlers, bare licensees, or others who go upon the premises, not by invitation express or implied, but for their own purposes and pleasure or to gratify their curiosity, howsoever innocent or laudable their purpose may be, and whether children or adults. (Vermont Supreme Court, Coburn vs. Village of Swanton, 109 Atlantic Reporter 854.)

Street Railroad Franchise Interpreted

A street railroad franchise authorizing the construction of necessary side tracks, turnouts, and switches, when construed, as it must be, strictly against the grantee, does not authorize the construction of a loop. A street railroad franchise authorizing the occupation of certain streets and no other, among them a street from Grandview Avenue to a destination, does not give any right to occupy Grandview Avenue; "from," as a general rule, excluding the terminus referred to. (Iowa Supreme Court, City of Dubuque vs. Dubuque Electric Company, 177 Northwestern Reporter, 700.)

Trading Stamp Ordinances

An ordinance, prohibiting the issuance of trading stamps, profit-sharing coupons, and gifts of like character in connection

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FLUSHING and SPRINKLING UNITS

Forty feet from curb to curb—sand filled brick pavement—cleaned in one trip with three nozzles.

The machine has four nozzles which can be used discharging one, two or three flushing streams at the same time.

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Municipal Supply Company

South Bend, Indiana

with the advertisement and sale of goods, is void. (Colorado Supreme Court, City and County of Denver vs. United Cigar Stores Co., 189 Pacific Reporter, 848.)

Restricting Undertakers' Locations

In a decision handed down June 11, in the case of City of St. Paul vs. Kessler et al., the Minnesota Supreme Court holds that undertaking establishments and so-called funeral homes may properly be held a nuisance in districts of a city occupied exclusively for residences, and an ordinance prohibiting them therein is valid, provided the city has been granted the authority to restrict or prohibit nuisances. The opinion further holds that the St. Paul charter confers such authority, by granting power "to define, regulate and abate nuisances," and "to regulate the location of stockyards, slaughter-houses, rendering plants, soap factories, tanneries, stables, privies, and other unwholesome or nauseous houses or places."

The Court adds that the general welfare clause of a municipal charter empowers cities to "prescribe districts within which no business or occupation of a noxious or offensive character or which tends to interfere with the comfort and prosperity of others may be carried on."

Status of Municipal Water Plants

Under the public service corporations law of Pennsylvania the State Public Service Commission has no jurisdiction to determine the reasonableness of water rates charged by a city.

"When rendering the same character of service as public service companies, municipalities for many purposes must be considered and treated like private corporations * * *, but, for the purposes of supervision over their internal management * * * it can readily be seen they may justifiably be put on a different basis from ordinary public service companies, for, though engaged in rendering the same kind of service as the latter, and entitled to derive therefrom a just gain * * *, municipalities are supposed to act primarily for the public good—not to earn dividends. Moreover, they are financed along quite different lines from other corporations, and managed by popularly elected officers, who, as just said, are presumed to act for the public weal, and when they fail to do so, may be turned out by their constituents at stated intervals. These considerations, with others which may readily be called to mind, account for and justify the omission of municipal corporations from the general application of our Public Service Company Act."

But under the statutes of Pennsylvania a court of equity has jurisdiction to adjudicate a complaint of a consumer that a city operating a water plant is enforcing unreasonable and discriminatory rates to his prejudice.

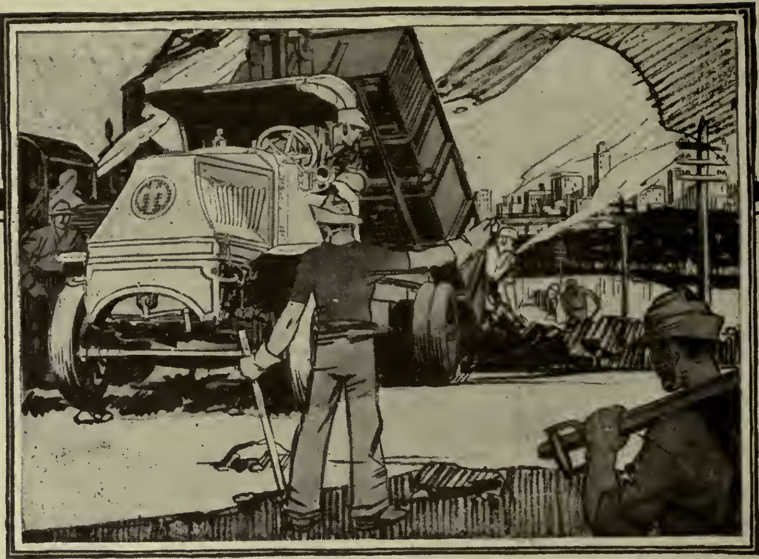
And a statute purporting to empower a city to give unfair preferences or to make unfair discrimination between customers would be unconstitutional as depriving citizens of property without due process of law.

"While, necessarily, a wide range of discretion is allowed municipal authorities in fixing public service rates * * *, and classification of users is permitted * * *, yet a city operating a legalized monopoly, in the nature of a water plant, cannot give undue or unreasonable preference or advantage to, or make unfair discrimination among, customers, any more than a private corporation similarly situated."

Where a municipal water-works plant enjoys a monopoly of the business of supplying water to the inhabitants of a city, a consumer will not be estopped to sue to determine the reasonableness of rates, asserted by him to be excessive or discriminatory, through his continuing use of and payment for water. (Pennsylvania Supreme Court, Barnes Laundry Co. vs. City of Pittsburgh, 109 Atlantic Reporter, 535.)

Taxicab Stand Locations

It is within the powers of a city to abolish a particular street stand for vehicles operated for hire, although the same may have been established by prior ordinance, unless it appears that the city authorities are acting unreasonably in abolishing the location. "The creation of stands of this character and their abolition is largely discretionary with the city council. What may operate at one time to create the stand may be not proper at another time." (Texas Court of Criminal Appeals, Ex parte Stallcups, 220 Southwestern Reporter, 547.)



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Municipal and Civic Publications

WATER PURIFICATION PLANTS AND THEIR OPERATION.

Milton F. Stein, Member Am. Soc. C. E. Second edition. John Wiley & Sons, Inc. 1919. X + 269 pp. Illustrated.

The first edition of this valuable book for waterworks operators met with such unqualified success that a second edition, involving a few changes, is welcomed. This edition contains material changes only in two chapters, namely, those covering the bacteriological testing of water and the interpretation of chemical, physical and bacteriological tests. For those who do not know this book well a review of the chapter headings will be of value: Water and Its Impurities, Types of Purification Plants, Physical and Chemical Tests, Bacteriological Testing of Water, Interpretation of Tests, Coagulation and Sterilization, Water Softening, Sedimentation, Filtration, and General Operation.

MODERN ROADS.

H. Percy Boulnois, Past President, Institute of Municipal and County Engineers. Edward Arnold, Publisher, London. 1919. VII + 302 pp. Illustrated.

An interesting discussion of modern road problems from the English standpoint, covering the questions of traffic, construction and maintenance of macadam roads, tar treatment of road surfaces, bituminous roads, bituminous carpets, waves and corrugations, paved streets, concrete roads, and schemes for preventing skidding on streets. Of particular interest to American engineers is the discussion of the Teddington road testing machine used for measuring the wear on roads, with graphs of road surfaces before and after testing.

ENGINEERING FOR LAND DRAINAGE.

Charles G. Elliott, Consulting Drainage Engineer, U. S. Department of Agriculture. Third edition. Revised. John Wiley & Sons, Inc. 1919. XIII + 363 pp. Diagrams.

The third edition of this book has been entirely rewritten to embody all knowledge in the development and extension of land drainage which has taken place in the last twenty-five years. The book discusses the development of land drainage both in Europe and the United States, and outlines the qualifications and work of the drainage engineer and the technique which he must follow, methods of drainage, including the preliminary surveys, underdrains and their location, the flow in underdrains, the run-off from underdrained areas, and the necessary sizes of tile-drains and their selection and construction. In addition, the questions of flow in open channels and the run-off from large areas are analyzed. The final chapters deal with the subject of the location and construction of open ditches and their problems, the laying out of drainage districts and levee drainage systems, the reclamation of tidal lands and the drainage of irrigated lands, the drainage of peat and muck lands, the control of hill waters, the drainage of home surroundings, and the all-important subject of estimates and accounts.

EMPLOYMENT STANDARDIZATION IN PUBLIC SERVICE.

William C. Beyer, Assistant Director, Bureau of Municipal Research of Philadelphia. Supplement to the "National Municipal Review." National Municipal League, Concord, N. H., June, 1920. 12 pp.

This pamphlet analyzes the problem of compensation for public service, including the phases of equal pay for equal work, and the adjustment of scales with reference, (a) to compensation for similar work in private employ, and (b) to a figure estimated to represent the cost of living for individual or family. The problem of selection for promotion is also considered, with a brief and rather discouraging allusion to the system of "efficiency records" with which Chicago and other cities have experimented.

SHANGHAI MUNICIPAL COUNCIL.

Report for the Year 1919, and Budget for the Year 1920. 8 by 13 inches. 276. 55. 122 pp. Views, tables, diagrams.

HIGHWAYS GREEN BOOK.

American Automobile Association, Riggs Building, Washington, D. C., 1920. 525 pp. Illustrated.

This very complete and useful book is an encyclopedia of information on national, state and local highway legislation, development, construction and maintenance. Many of the chapters were prepared or revised by the leading highway authorities of the United States and Canada. This book will be particularly valuable to those who have to do with molding public sentiment for better roads, and to legislators whose duty it is to determine matters of public policy and to frame adequate laws relating to motor vehicle taxation, registration and regulation, highway financing, management, construction and maintenance. The book is issued as an annual by the Good Roads Board of the American Automobile Association.

THE EMPIRE MUNICIPAL DIRECTORY AND YEAR BOOK, 1920-1921.

Sanitary Publishing Company, Ltd., London, England. 1920. III + 268 pp.

A complete directory of municipal, highway, water, sewerage and lighting engineers, fire brigade officers, street cleaning superintendents and health superintendents of the British Empire. This book is of particular value to municipal officials and associations in the United States desiring to communicate with officials in the countries making up the British Empire. The current issue includes a lengthy section on roads and road making, and reinforced concrete road systems, and a complete list of books on road construction and maintenance, water-supplies, water purification and softening, sewerage and sewage disposal and municipal legislation in Great Britain, a list of books on meat and food inspection, and a section on town planning.

ORGANIZATION OF PUBLIC HEALTH NURSING.

Annie M. Brainard. The Macmillan Company. 1919. XII + 44 pp. Diagrams.

This small volume is one of an interesting series of public health nursing handbooks, which have already covered industrial nursing and sanitation for public health nurses. The present volume brings out the need of organization, the fundamental principles and forms of organization, the nurse's part in organizing public health work and how such work should be instituted in a new community, the functions of boards of directors and committees of finance, the necessity and usefulness of a committee on nurses, the supply committee, and the value of records and statistics. The concluding chapter discusses the need of reorganization in some communities, and methods by which it may be brought about.

THE HOUSING SITUATION IN ENGLAND AND THE UNITED STATES.

F. T. Miller, President, F. W. Dodge Company. Published by the F. W. Dodge Company, 119 West 40th Street, New York City. 1920. 32 pp.

This pamphlet describes the present housing conditions, analyzes the causes of the shortage of houses, and explains the measures of relief that have been adopted and their results. It traces the cause of the present shortage back to scarcity of production due to lack of proper economic and moral incentive for the exertion of energy by workers, and maintains that "legislation promoting wider ownership of property can alone call forth the energy necessary for the maximum of production."

THE PRINCIPLES OF SOCIOLOGY.

Edward Alsworth Ross, Ph.D., LL.D., Professor of Sociology, University of Wisconsin. The Century Co., New York. 1920. XXVIII. 708 pp.

REPORT OF THE NEW YORK STATE BRIDGE AND TUNNEL COMMISSION.

The 1920 report to the Governor and Legislature of the State of New York. Views, tables, drawings. Quarto. 82 pp.

COMMON SENSE AND LABOUR.

Samuel Crowther. Doubleday, Page & Company, Garden City, N. Y., 1920. 284 pp.

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THE PORT OF NEW YORK.

Thomas E. Rush, Surveyor of the Port. Doubleday, Page & Company, Garden City, N. Y. 1920. XXV. 361 pp. Illustrated.

ELECTRIC RAILWAYS. (CENSUS OF ELECTRICAL INDUSTRIES, 1917.)

Bureau of the Census, Washington, D. C. Quarto. 177 pp.

ANNUAL REPORT OF THE NEW YORK STATE TAX COMMISSION, 1918.

Legislative Document No. 115. 1919. 531 pp.

STANDARDS OF WEIGHTS AND MEASURES.

Report of the Twelfth Annual Conference on Weights and Measures of the United States, held at the Bureau of Standards, Washington, D. C., May 21-24, 1919. 224 pp. Diagrams. (Apply to the Government Printing Office.)

HOUSING IN NORWAY.

"An Example of Town Planning in Norway: Notes on the Development of Trondhjem," by Sverre Pedersen, Town Architect, Trondhjem. A 12-page illustrated reprint from the March, 1920, issue of the **Garden Cities and Town Planning Magazine**, giving an interesting account of the local housing history and present conditions, and the plans for the expansion of the town. The municipal factory for the manufacture of wooden houses is a feature of this work. Also reprinted from the same issue, "Housing in Norway," by Christian Gerloff, Secretary-General of the Norwegian Housing and Town Planning Association; 8 pp., illustrated, outlining the prevailing plan of municipal house building and the endeavor to form public utility societies—or "building-municipalities"— for the sole purpose of building and letting houses; containing a view and description of a row of experimental houses in Trondhjem, built of different materials, with a view to testing the qualities of each. (Apply to The International Garden Cities and Town Planning Association, 3, Gray's Inn Place, Gray's Inn, London, W. C. 1.)

ELECTRIC DRIVEN WATER WORKS IN INDIANA.

"The Application of Electric Motive Power to Small Water Works Plants in Indiana." By D. D. Ewing, Professor of Electrical Engineering, and G. C. Blalock, Instructor in Electrical Engineering, Purdue University. December, 1919. Bulletin No. 4 of the Engineering Experiment Station, December, 1919. 100 pp. Views, tables and diagrams. (Apply to the Engineering Experiment Station, Purdue University, Lafayette, Ind.)

COMMERCIAL HANNDBOOK OF CHINA.

By Julean Arnold, Commercial Attaché, and various American consular officers and Chinese and American contributors. In 2 volumes. Miscellaneous Series No. 84 of the U. S. Bureau of Foreign and Domestic Commerce, 1920. 629 and 470 pp. Maps, views, tables. (Apply to the Government Printing Office.)

HOME BUILDING FOR WAGE EARNERS.

An analysis of the present financial and economic problem of supplying homes for workers. It discusses proper rents, the advantages of home owning, the guarantee of repurchase by the employer, the financing of building undertakings by Loan Associations, Mortgage Finance Corporations, and Consolidated and Individual Realty Companies, methods of selling, and co-partnership housing. Village planning, types of houses and their essentials are also touched upon. The appendix contains many forms for use by employers in selling or renting to employes. (Apply to Fred T. Ley & Co., Inc., 50 Central Park West, New York City.)

INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.

Proceedings of the Forty-Seventh Annual Convention of the Association, held in Kansas City, Mo., June 24-27, 1919. Illustrated. 334 pp. (Published by the Secretary, James McFall, General Fire Marshal, Emergency Fleet Corporation, United States Shipping Board, Philadelphia, Pa.)

TOWN PLANNING PAPERS AND DISCUSSION.

"Town Planning with Reference to Factory Development and the Distribution of Goods," by W. H. Gaunt, read at the March 5, 1920, meeting of the Town Planning Institute; Town Planning Reports and the Graphic Representation of Statistics," by Major George B. Ford, read at the meeting of the Institute on April 6, 1920. Each with the discussion thereon. Quarto. (Published by the Town Planning Institute, 4, Arundel Street, London, W. C., England.)

SEWAGE DISPOSAL.

Public Health Bulletin No. 101, issued December, 1919, by the U. S. Public Health Service. Containing "Studies of Methods for the Treatment and Disposal of Sewage," made under the supervision of Earle B. Phelps, Professor of Chemistry, U. S. Public Health Service; and "The Treatment of Sewage from Single Houses and Small Communities," by Leslie C. Frank, Associate Sanitary Engineer, and C. P. Rhynus, Assistant Sanitary Engineer, U. S. Public Health Service. Prepared by direction of the Surgeon General. 117 pp. Illustrated. (Apply to the Government Printing Office.)

RECREATION SUGGESTIONS.

Three pamphlets published by Community Service (Incorporated), 1 Madison Avenue, New York City, the first one in coöperation with the Playground and Recreation Association of America: "Community Recreation," December, 1919, 122 pp., containing suggestions for recreation boards, superintendents of recreation, and community recreation workers; "Comrades in Play," February, 1920, 84 pp., describing leisure-time activities which the young men and young women of America can enjoy together; "Summer Camps, Municipal and Industrial," June, 1920, 43 pp. Each one of handy size and full of practical, detailed information.

NATIONAL COMMISSION OF FINE ARTS REPORT.

Containing a review of the progress made in carrying out the plan of Washington prepared in 1901 under the direction of the late Senator McMillan by the commission composed of Messrs. Burnham, Mc-Kim, Saint-Gaudens, and Olmsted, and outlining the work to be done in the immediate future for the development of the National Capital. Including also material on the improvement of Army and Navy medals and insignia, a discussion of the plans for American cemeteries in France, and advice to persons interested in erecting war memorials. There is a chapter on the memorials now being erected in Washington. 148 pp. and 70 illustrations, including a full set of pictures of the Lincoln Memorial. (Apply to the Government Printing Office.)

TRANSACTIONS OF THE OKLAHOMA SOCIETY OF ENGINEERS.

Report of the meeting held October 28, 1919, in Oklahoma City. 73 pp. Illustrated. Containing a map showing the surface water-supplies and sewerage systems of the state of Oklahoma. Among the papers presented, especial attention is called to the following: "Sewage Disposal," by V. V. Long, consulting engineer, of Oklahoma City: "Tissue Paper Roads," by R. E. Brownell, Highway Engineer, Portland Cement Association: "The Municipal Problem as a Unit," by Alfred Boyd, Dean of Engineering, A. & M. College, Stillwater: "Procedure in Grade Crossing Elimination," by A. I. Thompson, Engineer State Corporation Commission. Edited by the Secretary. (Apply to H. V. Hinckley, Secretary-Treasurer, 1018 North Harvey Street, Oklahoma City, Okla.)

PLAY DAYS IN RURAL SCHOOLS.

By C. J. Galpin and Eleanore Weisman. 20 pp. Published and distributed by the Agricultural Extension Service, College of Agriculture of the University of Wisconsin, K. L. Hatch, Assistant Director, the United States Department of Agriculture coöperating. Giving specific directions for making rural community play days delightfully interesting and stimulating. (Apply to the Extension Service of the College of Agriculture, The University of Wisconsin, Madison, Wis., for Circular 118, published September, 1919.)

Municipal Reports

Buffalo, N. Y.—Eighth Annual Report of the Children's Court. 1919. (Apply to George E. Judge, Judge of the Children's Court.)

Greeley, Colo.—Annual Report of the Water Department for 1919. (Apply to Milton Seaman, Superintendent.)

Johnstown, N. Y.—42d Annual Report of the Board of Water Commissioners. Filed with the City Clerk, January 20, 1920. (Apply to Grover E. Yerdon,

Minneapolis, Minn.—Thirty-seventh Annual Report of the Board of Park Commissioners. 1919. (Apply to Theodore Wirth, Superintendent.)

Port Arthur, Texas.—Second Annual Report of the Engineering Department. March 31, 1920. (Apply to Clarence E. Ridley, City Engineer.)

Washington, D. C.—Report of the Collector of Taxes of the District of Columbia for the fiscal year ended June 30, 1919. (Apply to the Government Printing

Selden Trucks Make a Record on Toledo-Buffalo Road

WITH the aid of ten SELDEN Trucks, twelve miles of monolithic brick paving were laid on the Toledo-Buffalo road, between Ashtabula and Conneaut, Ohio, in the record time of ninety-two days. And this road is pronounced by State and National Highway officials to be one of the finest in America.

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SELDEN TRUCK CORPORATION, Rochester, N. Y., U. S. A.

Methods, Materials and Appliances

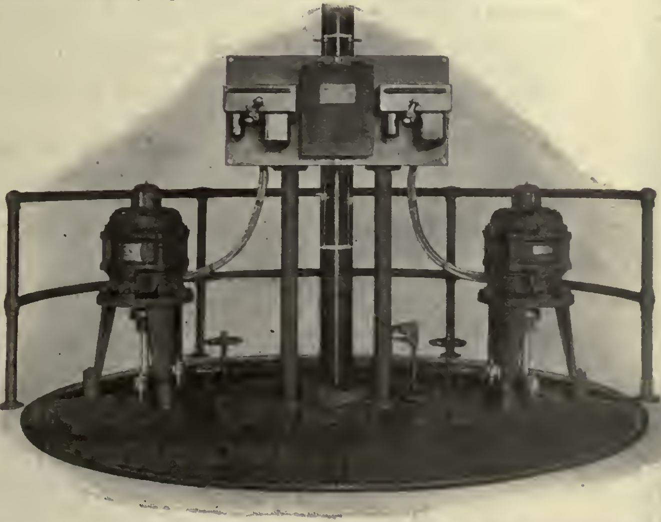
News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

An Electric Sewage Pumping Station

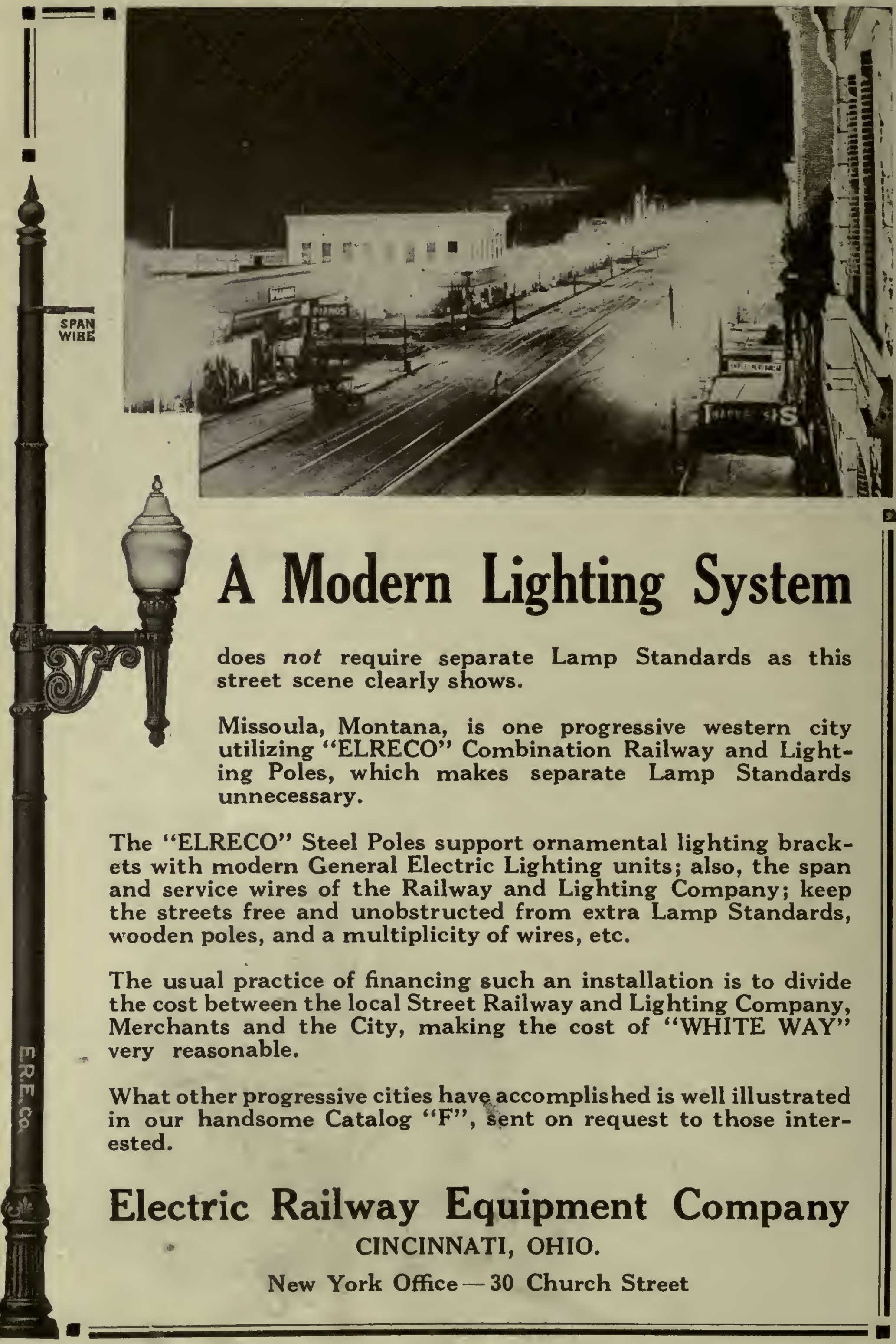
The ready and dependable removal of sewage from drainage sumps in the low sections of cities is essential to prevent the backing up of liquid waste in basements. In order to care for such situations, Yeomans Brothers Company, 1417 Dayton Street, Chicago, Ill., has developed the Duplex electric centrifugal sewage ejectors. The sewage receiver into which the flow from the sewerage system runs consists of a cast iron cylinder with bowl-shaped bottom, so shaped to prevent the accumulation of solids. The centrifugal pumps used are of the bottom-suction, vertical, open-impeller, centrifugal type with forced-feed, lubricated, split, babbitted thrust bearings and bronze-covered shafts. The motors, which are mounted on the floor above the pumps, are of the vertical-shaft, semi-enclosed, slow-speed type with the thrust bearings in the upper heads. Each ejector is supplied with a float-operated alarm which rings a bell if the water level in the receiver rises above the point at which the pumps are set to start. This alarm float is independent of the controller float which operates the pump. The discharge connections of each pump are equipped with bronze-fitted, horizontal-swing check valve with renewable seat and extended-hinge pin with external lever, so that the valve can be opened for flushing back through the pump and the operation of the check valve can be observed at all times. Gate valves are provided in each unit between check valve and riser to street sewer. All connections from the pumps to the double-branch connection in the riser are made with flanged, long-turn fittings and are supported by a pipe standard mounted on the base of the receiver. A cast-iron bar screen 36 inches in diameter is provided in the receiver just below the inlets. This screen is of such mesh that it will pass paper and soil but will intercept heavy or unusual obstructions which may come through the drains. It is made in sections and can be easily cleaned, without taking it out, through the manhole in the receiver wall. These ejectors are usually installed in a circular pit of suitable dimensions, consisting of a steel shell embedded in concrete. If preferred, the ejector may be installed in a concrete pit without the steel shell, and the pit may be round, elliptical, or rectangular, as local conditions demand.

Consoer Joins Older & Quinlan

The engineering practice of Older & Quinlan, consulting engineers, 1654 Monadnock Block, Chicago, Ill., has been merged with the practice of Arthur W. Consoer under the corporate name of the Consoer Engineering Company, with executive offices at the above address. Clifford Older is President of the company, George A. Quinlan, Secretary and Treasurer, and Arthur W. Consoer, Vice-President and Business Manager. This firm will engage in the practice of consulting engineering in municipal paving, sewerage, water-supply, drainage, bridges and industrial building.



A SEWAGE PUMPING UNIT FOR LOW DISTRICTS OR LARGE BUILDINGS



A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

Missoula, Montana, is one progressive western city utilizing "ELRECO" Combination Railway and Lighting Poles, which makes separate Lamp Standards unnecessary.

The "ELRECO" Steel Poles support ornamental lighting brackets with modern General Electric Lighting units; also, the span and service wires of the Railway and Lighting Company; keep the streets free and unobstructed from extra Lamp Standards, wooden poles, and a multiplicity of wires, etc.

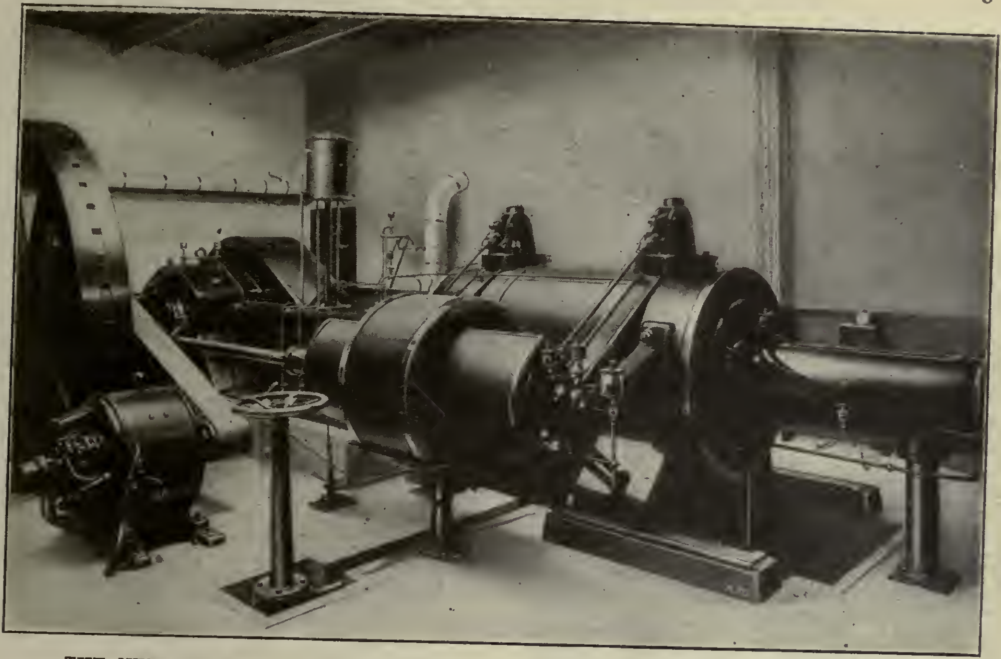
The usual practice of financing such an installation is to divide the cost between the local Street Railway and Lighting Company, Merchants and the City, making the cost of "WHITE WAY" very reasonable.

What other progressive cities have accomplished is well illustrated in our handsome Catalog "F", sent on request to those interested.

Electric Railway Equipment Company

CINCINNATI, OHIO.

New York Office—30 Church Street



THE NEW 600-H. P. ENGINE RECENTLY INSTALLED AT PORT WASHINGTON, WIS.

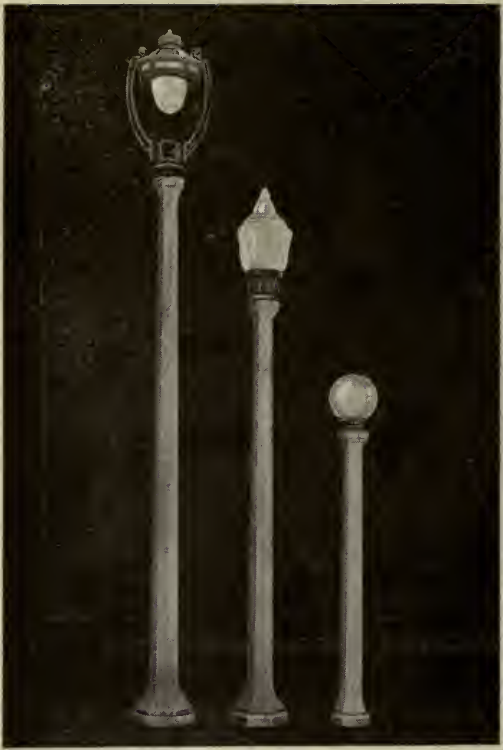
Addition to Municipal Power Plant, Port Washington, Wis.

One of the interesting features of the manufacturing city of Port Washington, Wis., is the municipal water and lighting plant, enlarged last year much to the benefit of the city. A new 600-h.p. Uniflow engine, made by the Nordberg Manufacturing Company, Milwaukee, Wis., and a new General Electric generator were installed at a cost of $35,000. This enlarged the plant so that it now includes three Nordberg engines, two Corliss type and one Uniflow type which can carry a 1,200-h.p. load, making it one of the best-equipped municipal water and light plants in Wisconsin. The plant is on a sound financial basis and is making money for the city.

Hand Electric Search-Lights for Emergency Service

There is scarcely a municipal department where a powerful electric hand light will not be found of use, particularly in fire and police departments, whose protective work takes them through smoke, fog, steam and chemical vapors. Also water-works departments where leaks must be sought out in dark cellars or at night along gloomy streets, find them of great service. It is for such work as this that the Grether Manufacturing Company, Dayton, Ohio, manufactures a hand search-light such as is illustrated herewith, which will throw a powerful ray of light from 350 to 400 feet. This search-light has exceptional brilliancy and penetrating force. Smoke, water, vapor, steam, and chemical fumes do not affect the operating efficiency of the search-lights, which is the reason that they are used so extensively by firemen, police and others engaged in emergency or rescue work. The actual burning capacity of the light averages 18 hours, but when used for long continuous periods the batteries wear out quicker than when used for short intermittent periods.

A HANDY ELECTRIC SEARCH-LIGHT FOR EMERGENCY WORK IN MUNICIPAL DEPARTMENTS



Concrete Lighting Standards

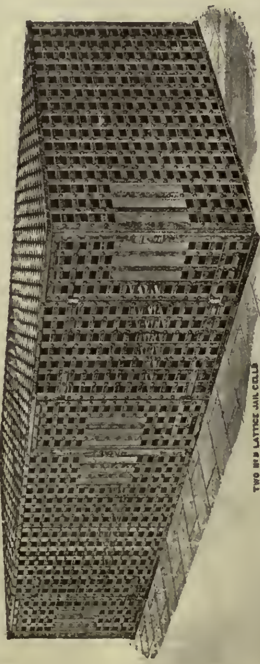
Elegance, Permanence, Utility Combined

1. **THE BOULEVARD** — Height 13′-0″. For Parks, Drives and Boulevards.
2. **THE BROADWAY** — Height 10′-0″. For Business Thoroughfares and Residential Lighting.
3. **THE UTILITY** — Height 7′-0″. For Safety Islands, Entrances to Public Buildings and Ornamental Lighting.

Write for particulars

American Concrete Products Co.
30 N. La Salle St. Chicago, Ill.

STEEL JAIL CELLS AND JAIL WORK



TWO [illegible] LATTICE JAIL CELLS

Jail Entrance Doors, Jail Bedsteads. Window Guards, Steel Plate Lining, Stairs, Folding Steel Bunks.

SEND FOR CATALOGUE IF INTERESTED.

E. T. BARNUM IRON WORKS, Detroit, Mich.

The Key to Vigilance

HARDINGE SYSTEM
of
Police Registration

High Efficiency
Low Cost

Write for Book—"Key to Vigilance"
HARDINGE BROTHERS, INC.
4147 E. Ravenswood Ave., Chicago

A TYPICAL DE LAVAL INSTALLATION IN DURHAM, N. C.

High Efficiency in Centrifugal Pumps

The city of Minneapolis recently made a test of one of its centrifugal pump installations in which the pump showed an over-all efficiency of 86 per cent and in which the over-all efficiency from "wire to water" averaged 82.48 per cent over a period of nine months.

In addition to this interesting installation of De Laval centrifugals, nearly as good results were shown by two 12-inch pumps at the McCarren pumping station of the city of St. Paul. The specifications required that each unit should be guaranteed to deliver not less than 5,000 U. S. gallons per minute against a total head of 171 feet, and not more than 5,500 gallons per minute against a total head of 158 feet, the over-all efficiency from "wire to water" to be not less than 72 per cent when pumping continuously at either of the heads and deliveries.

The bid of the Northwestern Electric Equipment Company of St. Paul was accepted. It offered two centrifugal pumps manufactured by the De Laval Steam Turbine Company, Trenton, N. J., and synchronous motors of the rotating field type, guaranteeing an efficiency of 74.3 per cent at heads of either 158 or 171 feet, and an over-all efficiency of 73.7 per cent at 140 feet. The pumps are of the single-stage, double-suction, volute type, having 12-inch suction and discharge nozzles, with no diffusing vanes. After installation, both units were subjected to very complete tests to determine both efficiency and head-capacity characteristics. Before the official tests were run, the impellers had been turned down slightly in diameter, because the motors were operating at 20 r.p.m. above rated speed. Before beginning the test, the pressure gauge of each pump was taken off and calibrated on a dead weight testing instrument and then replaced, the pump stopped, and the static head of water determined by finding the elevation of the centers of the gauges and the elevation of the water in the high-service reservoir. Numerous other details of this type were carefully gone over to insure the accuracy of the test.

The quantity of water delivered was measured by a 30-inch x 13-inch Venturi meter, supplied by the Builders Iron Foundry, of Providence, R. I. The recording instrument supplied with this meter included an indicating dial, a recording card and an integrating counter, but in order to verify the accuracy of its readings an indicating mercury manometer was also connected to the pressure pipes of the Venturi tubes. In running the test, the head against which the pumps worked was controlled by means of a hydraulic gate valve on the discharge side of the pumps. After throttling the gate valve, no readings were taken until all the instruments had ceased fluctuating, after which two or three readings were taken, and averaged if any variations were found. Observations were made with the pumps operating under four different heads, covering a wide range of delivery. The results obtained from the official tests showed that pump No. 25650 had an over-all efficiency of 78.4 per cent and a pump efficiency of 82.2, operating at a total head of 143.25 feet. When pumping against a head of 185.75 feet, it had an over-all efficiency of 67.7 and a pump efficiency of 71.5 per cent. The tests of pump No. 25651, while slightly lower in pump efficiency and over-all efficiency at the 143-foot head, showed a pump efficiency of 77 per cent and an over-all efficiency of 72.8 per cent when pumping against a total head of 178 feet.

In many places centrifugals are replacing the old triple-expansion reciprocating pumps, particularly where it is necessary to economize space. While the actual per cent efficiency of the centrifugal may be slightly less, the size and the labor costs make up the difference.

THE CLARKSBURG, W. VA., WATER-WORKS ARE WELL KNOWN FOR ECONOMICAL OPERATION

Necessary conservation of coal, because of high price and difficulty in securing ample supply, demands serious consideration

Make every scoopful count by installing G-E Flow Meters

On boilers—they show up careless firing, unequal boiler outputs, dirty tubes, holes in fires, incorrect drafts, etc., all of which waste coal.

On steam lines to departments and processes—they show the amount consumed from which operating costs can be determined as well as leaks, careless operations, etc.

On feed water lines—they show the amount of water delivered to the boilers, from which the evaporation factor can be computed—information of the utmost importance.

All G-E Flow Meters are simple, reliable and accurate, requiring only reasonable care for satisfactory operation.

Write our nearest office for Booklet, "A Guide to Boiler Economy," and Bulletin 46501-C describing G-E Flow Meters for all applications.

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in
all large cities

134C-22

Recovering Fibrous Material from Municipal Refuse

The economical disposal of city rubbish has received much attention. A great many systems have been devised and some of them are working very successfully and at good profit in the reduction of garbage. Ashes are of no possible use except for filling in low ground. While very much experimenting has been done to recover the fibers from city rubbish, it has never been particularly successful. About the only way to recover paper stock from city rubbish is by the use of a belt. The stock is placed upon the belt, and as the belt passes along some of the valuable material is picked off, but all which remains is thrown upon a dump or burned in incinerators. This has never been successful, because only a small portion of the fibers are recovered. The cost of the labor for picking off these fibers has always offset the selling price of the stock.

For some time the Shartle Continuous Beater Company, of Middletown, Ohio, has been convinced that the machinery as designed by this company for removing foreign material from ordinary mixed papers, with a few modifications, could be adapted for the removal of paper stock from a large amount of foreign material, or rather, city rubbish. To demonstrate this, two car-loads of rubbish were shipped from Pittsburgh to Toronto, Ohio, where it was put through a system installed by this company in a paper mill. From the demonstration they were convinced that they could design a plant which would remove about 98 per cent of the fibers from city rubbish. The rubbish was not sorted except to take out large boxes or crates that might be collected by the wagons. The weight of the material was approximately 37,570 pounds.

The material was carried by the conveyor from the car to the third floor of the mill, the bale wire was taken off, and the material, containing wood and metals as well as paper stock and other refuse, was dumped down a chute into a breaker. Because of a right-angle turn in the pipe leading from the breaker to the settling trough, large pieces of wood were taken out by hand. After the material circulated with water, it went through an overflow in the breaker into an 18-inch pump, having a 16-inch ball and a 12-inch inlet and outlet. No trouble occurred due to tin cans or wood in this pump. From the pump the material went to a settling trough, approximately 30 feet long, 2 feet wide and 18 inches deep, and then went to a circular tank, where floating material was skimmed off by hand. The settling trough was cleaned occasionally, and from it tin cans, iron and dirt were obtained. From the circular tank the material went to two flat screens, approximately 20 feet long, in series, equipped with drags or scrubbers which scraped off any material that would not go through the screen plates. The paper stock which had been broken up fine enough went through the screen plates to a pulp thickener, and from there to the Jordan chest. The rags and material that would not go through the screen were scraped off into a continuous beater equipped with a perforated metal back fall. Here the rags were cut up and beaten and put through the beater to the chest. The material in the chest was pumped through two other intermediate chests and finally over the paper machine. This machine was of the cylinder type, with four cylinder molds having 18-inch trim, equipped with 30 dryers. The grade of paper made on this test was indented board for glass packing. Approximately 11,500 pounds of this material was obtained, making a total reclamation of slightly over 30 per cent paper stock.

At a reduction plant in Pittsburgh, a total reclamation of 16 per cent of this rubbish is generally obtained, but this includes metal and glass. Ordinarily only 7 per cent of paper stock is obtained at this plant, the remainder being burned in the furnace. The test, therefore, demonstrated that at least four times as much paper stock was obtained by this process as was ordinarily obtained by usual methods of sorting. It is to be noted that the equipment of the paper mill was built to use mixed papers and was adapted for that work. Certain improvements and changes should be made if it were to be used for dump stock. The further advantage of this method of reclaiming paper stock is that labor costs can be materially reduced, since only 15 men working in three shifts are needed if an ordinary wet pulp machine is used in place of the cylinder machine with dryers. At the plant of the reduction company in Pittsburgh, Pa., under normal conditions, approximately 100 men and 100 women are used, for this plant must run 24 hours a day to take care of the incoming rubbish from the wagons.

The cost of installing machinery for the purpose of reclaiming paper stock by this "flotation-sedimentation" method would not be very great, as it requires only a breaker, large pump, settling trough, large screen, pulp thickener, continuous beater, chest and wet pulp machine. This test, as made, was not an accurate one, and was merely an attempt to demonstrate what could be done. The weight of the baled rubbish was obtained from the reduction company and the weight of the finished paper was obtained from the back tender of the paper machine. Before the test was begun the chests were run out, and at the conclusion of the test all the material which came from the rubbish bales was run out and weighed as finished paper. This test was witnessed by representatives from the U. S. Bureau of Standards, and the greater part of this item was prepared from a report of the observer.

Nebraska's New Road Machinery

The shortage of men, materials and machines which may prevent many of the states from completing their road-building programs for 1920 is being felt in Nebraska, as it is elsewhere. As a result, the State Highway Department is concentrating considerable effort on

Modern and Serviceable

Modern ornamental street lighting renders various services of material benefit. First, it provides efficient illumination for your city. Second, it protects the lighted area from any possible crime. Criminals of all kinds prefer to work in the dark. They abhor light.

There are several other benefits to be derived from up-to-date street lighting, and if you are interested in maintaining the prestige of your city—if you are interested in creating civic pride —if you are interested in making a better city—send for our illustrated booklet.

APPEARANCE

Our ornamental lighting system is on the job 24 hours out of every 24. At night it lights up your business streets, residential sections, parks and boulevards. During the day the handsome poles greatly aid in beautyfying your city. There is nothing that can make a town more attractive than a neatly laid out system of ornamental street lighting.

Send your address for big descriptive booklet including many styles and designs.

KING
MFG. CO.
53 W. Jackson Boulevard
CHICAGO, ILL.

"WEARPROOF" NO PARKING SIGNS

For every purpose. and any wording desired.

"Wearproof" Signs possess the countersunken lettering time will not obliterate. Also, Street Signs, Highway Markers, Semaphore Traffic Signs, Danger Signs, etc.

Write for new catalog.

UNION IRON PRODUCTS CO.
Drawer H,
East Chicago, Indiana

The MURDOCK

PATENT ANTI-FREEZING

BUBBLE FONT

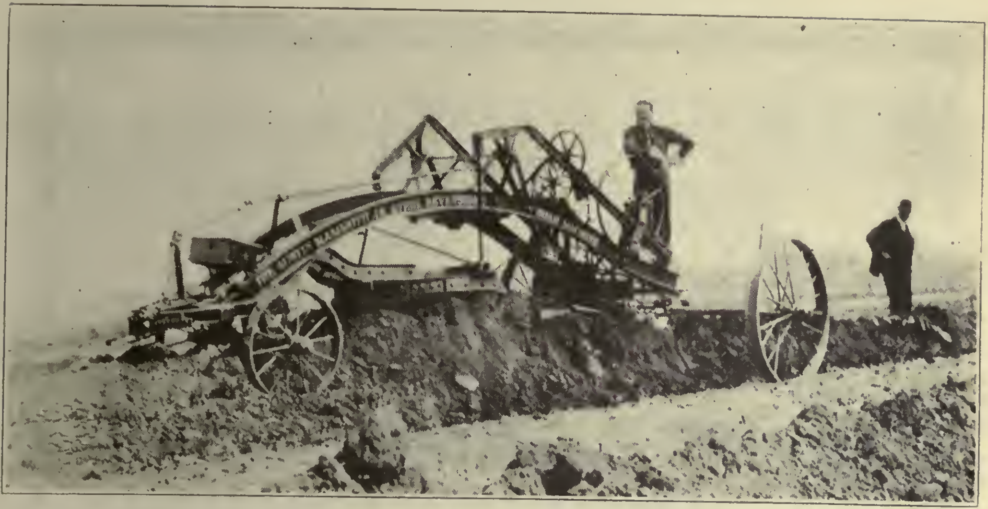
Is the only drinking fountain made that was designed and is built solely for outdoor use. It does not have to be turned off at the approach of cold weather.

THE ONLY FOUNTAIN MADE THAT IS STRONG ENOUGH TO WITHSTAND PUBLIC ABUSE.

Perfectly adapted for use on the Public Streets, in Parks, Playgrounds, School Yards, and all semi-exposed or uncertainly heated enclosures.

Write for fully illustrated literature to

The MURDOCK MFG. & SUPPLY CO.
(THE ORIGINAL HYDRANT HOUSE)
CINCINNATI, - - - - - OHIO
Builders of Water Service devices since 1853



A TYPE OF HEAVY-BLADE GRADER FOR USE IN PUSHING AHEAD NEBRASKA'S 1920 ROAD-CONSTRUCTION PROGRAM

the construction of earth roads which later on may be converted into hard-surfaced roads. This means that even though the mileage of concrete or other hard-surfaced roads built during 1920 may not be great, the state's road program will be going steadily forward. When the time comes for the construction of the hard surface, much of the preliminary work will be out of the way.

As part of this program the state has just purchased 70 Mammoth graders from the Austin-Western Road Machinery Company of Chicago. These big machines, weighing 6,350 pounds each and having 12-foot blades, were delivered in time for the opening of the road construction season. They are being distributed among the majority of Nebraska's ninety counties and are accompanied by heavy tractors.

This buying of graders in wholesale lots is a usual practice and shows the progressiveness of the Nebraska Highway Department.

New Firm of Industrial Consultants

The announcement is made, through an 8-page pamphlet, of an advisory engineering and industrial consultant service of wide availability and great range of applications offered by the Technical Advisory Corporation, 132 Nassau Street, New York, including three officers and seven principal associates, all but one of whom were members of the Technical Advisory Committee of the U. S. War Claims Board, with many affiliated associates. The officers are Campbell Scott, President, and Ernest P. Goodrich and William D. Ennis, Vice-Presidents. The corporation does not undertake construction contracts or assume financial responsibility. In its industrial section it undertakes work as economists, cost reducers and business advisers, and in its engineering section it furnishes complete factory and institutional layouts and specifications and supervises the execution of plans.

An All-Round Mowing Machine

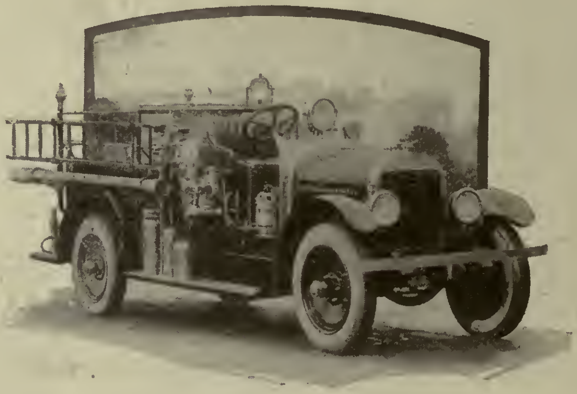
The new triple mower, manufactured by the Shawnee Mower Company, Shawnee-on-Delaware, Pa., shown in the accompanying illustration, is a machine which has brought forth a great deal of favorable comment from park superintendents and those in charge of large estates and golf courses. When it is necessary to cut a rough stretch of territory, this mower shows its particular advantage, as it can conform to the shape of the ground.

HORSE-DRAWN MOWER FOR CUTTING THE ROUGH IN PARKS OR LAWNS

Standardized and Engineered for Fire Service only

STUTZ

Fire Apparatus



Worthy of Your Consideration

STUTZ FIRE ENGINE CO.

Harry C. Stutz, President

Indianapolis, Ind., U.S.A

STUTZ

FIRE ENGINE CO.

Recent Addition to W. & T. Staff

The most recent addition to the rapidly increasing staff of Wallace & Tiernan Company, Inc., 349 Broadway, New York City, manufacturers of chlorine control apparatus, is Harold S. Hutton, who has been appointed District Sales Representative, with headquarters in the Commonwealth Building, Pittsburgh, Pa. Mr. Hutton is a sanitary engineer who has been connected with the Public Health Service. He succeeds P. O. Collins, who has been given indefinite leave of absence on account of illness.

WALLACE & TIERNAN CHLORINATORS USED IN THE CATSKILL AQUEDUCT OF THE NEW YORK CITY WATER-SUPPLY

Worthington to Manufacture Improved Water-Power Machinery

The Worthington Pump and Machinery Corporation, 115 Broadway, New York City, has just announced that in addition to the well-known lines of hydraulic machinery which this company has manufactured since 1840, it has completed preparations to manufacture improved water-power machinery of all capacities for low, medium and high head service, including oil pressure systems, water wheel governors and other auxiliaries. It is entering this field equipped to produce hydraulic turbines to meet the highest standards in design, efficiency and workmanship. To supplement the present staff, familiar with hydraulic problems, the company has secured the services of competent designers having many years of successful experience. The Hydraulic Turbine Department will be glad to receive inquiries and to be of assistance in the solution of any hydraulic and water-power problems for municipalities or private companies.

Steel Bodies for Collecting Garbage

The increasing use of motor trucks for garbage collection, particularly where there are long hauls, has brought about some radical changes in the construction of the bodies to make them most suitable for this service. Madison, Wis., has recently placed in service two Winther chassis fitted with garbage bodies and hydraulic hoists for dumping them. The bodies and hoists are manufactured by the Heil Company, 1243 Twenty-sixth avenue, Milwaukee, Wis. The body has six covers. The four front covers open from the sides, and the two back ones from the rear. Adjustable steps on either side of the truck and in the rear make it easy to load the body. The bodies are made of No. 10 gauge steel, and the covers of No. 12 gauge. The bodies are first riveted and then all the seams are welded. This prevents the garbage from dripping on the street. The tailgate is hinged at the top so that it swings outward when released. Four wing nuts are used to keep it tightly in place when the body is loaded. Rubber packing is used between the tailgate and the body to insure a water-tight joint. The body itself is 3 inches wider at the rear than the front, so that the load will dump freely. The body is furnished with a Hydro hoist, the latest improved type of hydraulic hoist on the market. This hoist permits the body to be placed just back of the cab, thus utilizing all of the loading space and making possible a body with lower sides. The bodies have a capacity of 81 cubic feet. They are also made without covers, in which case loops are pro-

A Quick Getaway

And No Lost Power on the Turns

EVERY man in the Fire Department knows what that means. And every property-owner learns its value to him, sooner or later.

Firestone Tires have proved themselves equal to the all-emergency demands of fire-fighting apparatus.

Whether light or heavy, horse or motor driven, Firestone lengthens the life of the apparatus by a long term of years and definitely increases its dependability in action.

The following manufacturers of fire apparatus use Firestone equipment:

Ahrens-Fox Engine Co., Cincinnati, Ohio
American & British Mfg. Co., Providence, R. I.
American-LaFrance Fire Engine Co., Elmira, N. Y.
Robinson Fire Apparatus, St. Louis, Mo.
The Seagrave Co., Columbus, Ohio

Most
Miles
per
Dollar

FIRESTONE TIRE & RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Firestone

WINTHER TRUCK USED BY THE CITY OF MADISON, WIS., FOR GARBAGE COLLECTION

vided so that a canvas cover can be tied over the load.

The Latest Development in Light-Weight Fire Apparatus

Municipalities and towns which have felt the least doubt regarding the value of light-weight fire apparatus, which heretofore has been solely of the chemical type, will be glad to learn of the new Childs triple combination hose, chemical and pump mounted on a Ford one-ton truck which is now manufactured by the O. J. Childs Company, Utica, N. Y. This new piece of apparatus retains all the valuable features of the Childs chemical truck and in addition carries a rotary fire pump specially designed to harmonize with the character of the power supply and the motor chassis as a whole.

The pump is of the positive displacement type, does not have to be primed, and will draw water a vertical height of 24 feet without the use of a foot valve. The pump is driven directly from the motor of the truck. The pump body is cast in one piece, reducing leakage to a minimum and practically eliminating vibration. The pump does not rack and strain the motor, but operates fast or slow, according to the speed of the motor. It is equipped with two suction and two discharge connections, one on each side of the car, thus making the apparatus very adaptable and eliminating all waste of time through having to turn the car around to face in the proper direction, as is the case with some of the larger engines The pump is mounted under the driver's seat, the drive being taken at a point in the rear of the transmission of the car, so that the ratios in the car transmission are available in connection with the pump. There is a connection between the pump and the radiator so that cold water is provided constantly to keep the engine from overheating. The entire apparatus is simplicity in itself and can be readily operated by any man capable of running the regular Ford car.

Two lengths of suction hose of 12 feet each, with 3-inch internal diameter, fitted with special heavy suction couplings, are provided with the car, and one special heavy suction strainer is also included. The water pump also connects into the chemical line with a heavy brass piping with valves. This permits pumping water through the chemical hose for finishing up work or for putting out small fires resulting from flying sparks or embers. The hose body is of steel and has a capacity of 1,000 feet of single-jacket, 3½-inch fire hose, or 700 feet of double-jacket 3½-inch hose. The body has a slanted bottom and is well braced and strongly built throughout.

Bitulithic Pavement for Boston Parkway

The Park and Recreation Commission of Boston recently let the contract for the pavement of Jamaica Way, part of the extensive park system of metropolitan Boston, to Warren Brothers Company, Boston, Mass., for $29,290.90. This contract was awarded after bids had been asked for asphalt, bitulithic and Topeka pavements. The Mayor has approved this contract, and a statement has been issued that the success of bitulithic pavement throughout the city warrants the acceptance of this contract even though it was nearly $600 higher than the lowest bid for the work.

For heavy hauling and rough work, no other truck tire you can buy is equal to the Kelly-Springfield Caterpillar.

It is the first cushion type tire to be successfully used on trucks of all weights and sizes.

It gives resiliency without danger of puncture or blowout. It saves the engine and chassis, cuts down repair costs and lengthens the life of the truck.

Its remarkable traction qualities give the truck more power with an actual decrease in gasoline and oil consumption.

It will not crack, chip or separate from the base, and its average mileage is double that of the ordinary truck tire.

Kelly-Springfield Tire Co.

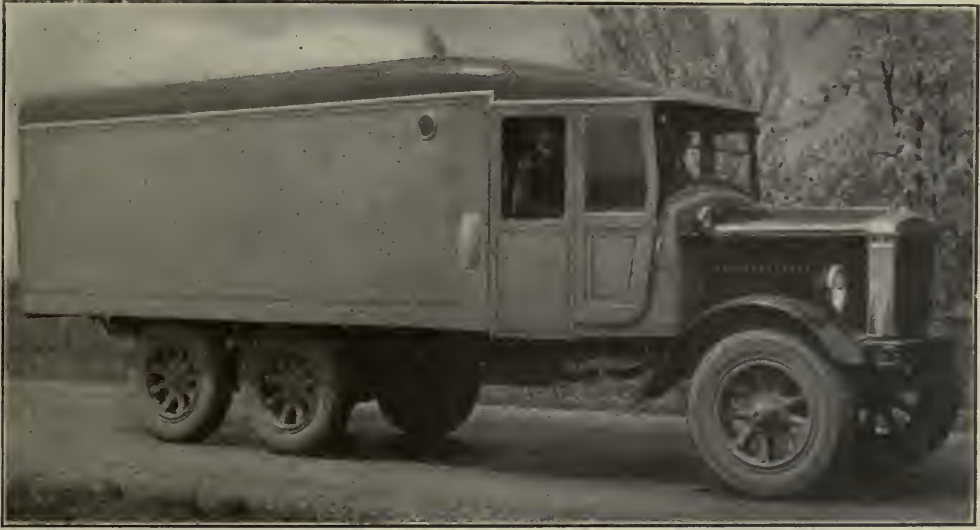
GENERAL SALES DEPARTMENT

1710 Broadway, New York, N. Y.

Enter the Six-Wheel Motor Bus

A pay-as-you-enter auto bus, patterned after the new type of street cars and capable of carrying 100 people, is being designed by the Goodyear Tire and Rubber Company, Akron, Ohio, as an experiment in broadening the field for the use of pneumatic truck tires, and will be operated in Akron. The new bus will have six wheels. It is the intention of the company later to equip the bus with eight wheels similar to the double trucks on street cars. Unfortunately photographs of the bus with its special passenger equipment are not available. The accompanying illustration, however, shows the arrangement of the six wheels, as the bus is now used with a commercial body.

The increased service of busses of this type, permitting the greatest cushioning of the load, thereby lessening the impact on the road, can be well appreciated by students of highway traffic. States now considering the passage of laws limiting the total weight of load and vehicle may have to reconsider their legislation in the light of the lessened load per inch of tire with the six-wheel bus, which is now a reality, and the eight-wheel bus or truck, which is promised in the near future.



A NEW DEVELOPMENT IN MOTOR BUS CONSTRUCTION WHICH INCREASES THE TOTAL LOAD, BUT DECREASES THE UNIT LOAD PER AXLE

Delaware Experiments with Bituminous Materials for Foundation and Surfacing

ONE of the great problems facing all highway departments to-day is whether it is more advisable to curtail road construction programs through diminishing the number of miles to be built in 1920 and 1921 or to change the nature of the surfacing from an expensive material, which it may be difficult to secure, to a less expensive material readily obtained.

In the case of Delaware there has been great trouble in securing cement shipments and there has been practically no difficulty in securing shipments of stone, sand or asphalt. At a conference held recently with the Chairman of the State Highway Department, it was decided that it would be very inopportune to retard the procedure of the 1920 program.

The original program covered approximately 80 miles of concrete highway. Only about half of this has been placed under construction. After carefully considering the present situation, it seemed somewhat doubtful about placing any more concrete highways under construction on account of the lack of cement shipments. Therefore it was agreed that the program should not be held up, but that the highway should consist of a bituminous foundation and an asphalt wearing surface. Plans are now being completed, and proposals will be called some time about the middle of August. There will be approximately 40 miles of road in this experiment. A smaller experiment consisting of approximately 15 miles of asphalt surface road was tried out in Sussex County, Delaware, and the results proved very gratifying to the users of these highways.

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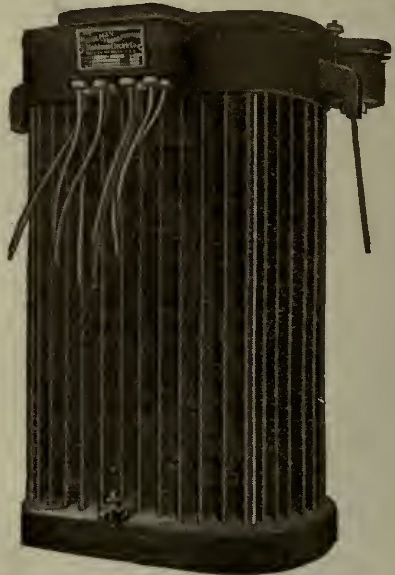

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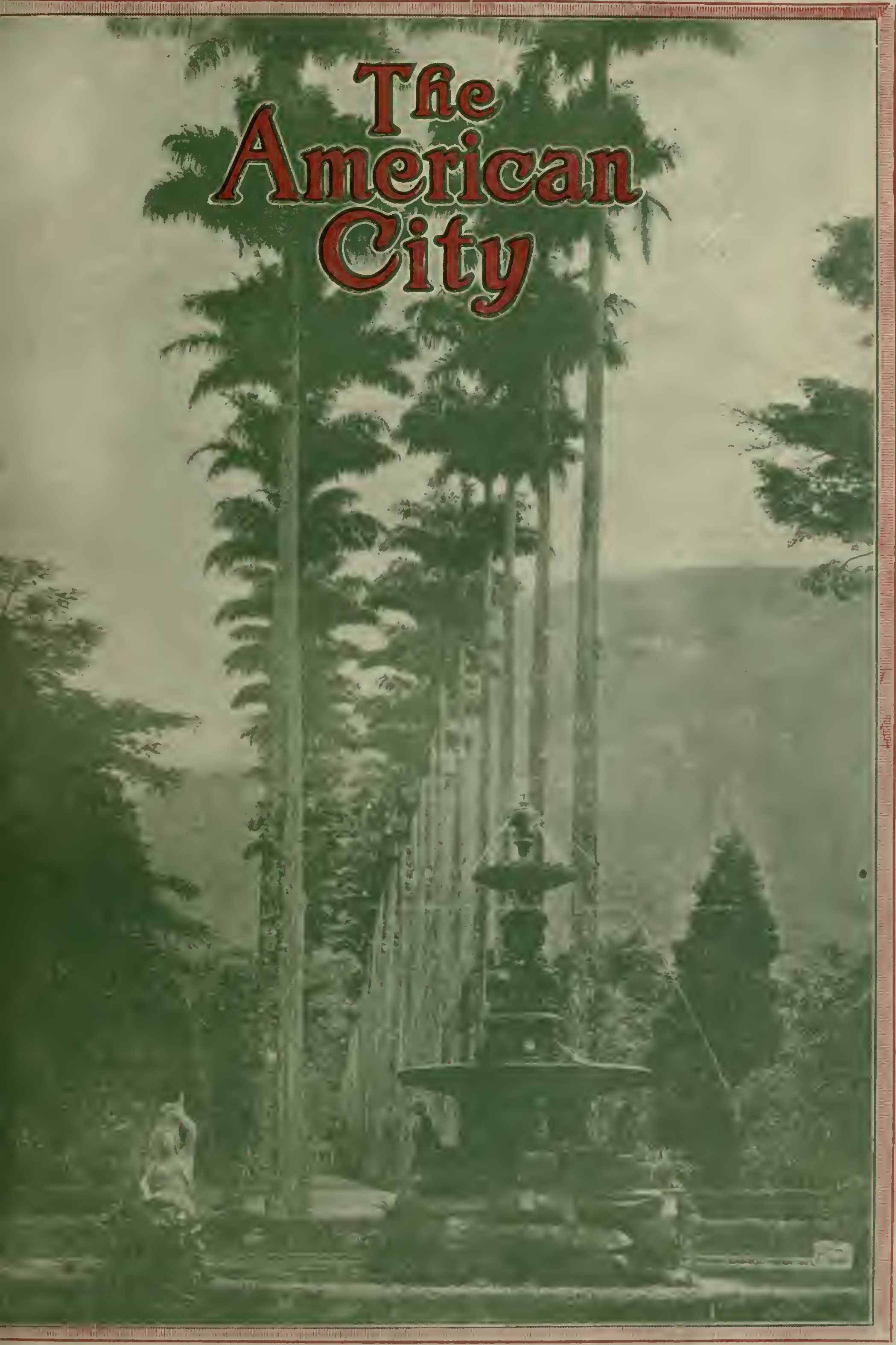

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The American City

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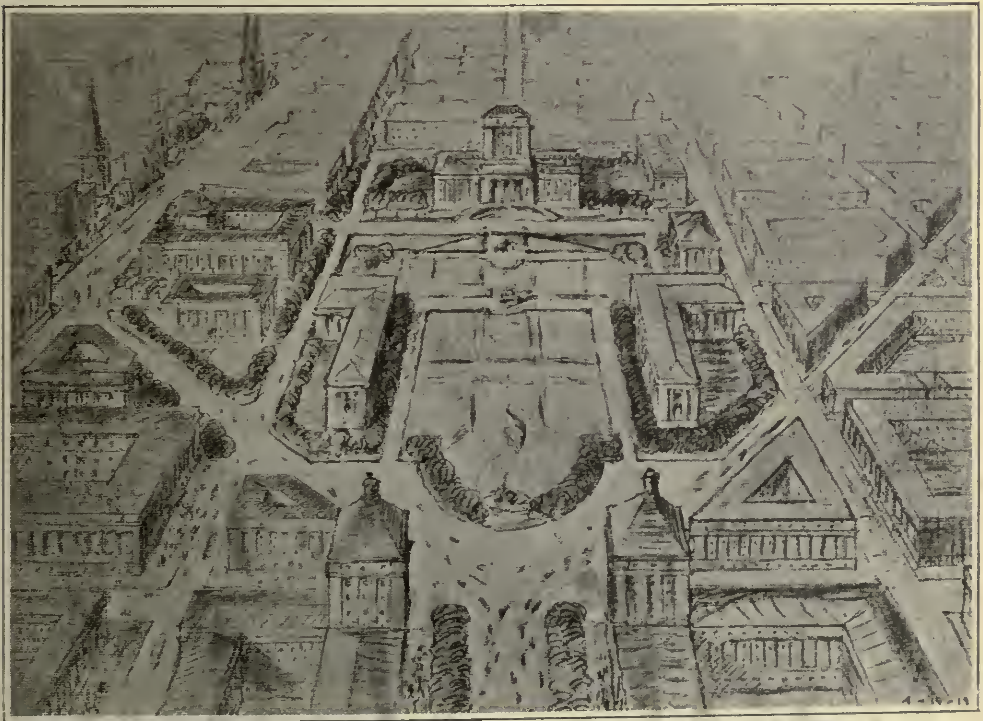
Civic Center Progress in Milwaukee

By Ovid B. Blix
Municipal Reference Librarian, Milwaukee, Wis.

MILWAUKEE definitely accepted a policy of grouping public buildings upon a civic center at the April municipal election, when an initiated civic center ordinance was carried by a large majority, obtaining an affirmative verdict in every ward in the city.

The civic center site approved in the referendum was first recommended by the Metropolitan Park Commission in 1909, endorsed by Frederick Law Olmsted and John Nolen late in the same year, and revised by the Board of Public Land Commissioners in 1919. Both City Council and County Board recorded themselves in favor of grouping buildings upon a civic center dur-



SUGGESTED GROUPING OF PUBLIC BUILDINGS IN MILWAUKEE, WIS.

ing the past year, but differences of opinion as to the proper location of the site delayed action. The majority of these bodies was reluctant to approve a measure involving the expenditure of as much money as a civic center project would necessitate without first ascertaining the sentiment of the voters, and seemed to favor the submission of several sites to the electorate.

It was found, however, that the Council had no authority to submit such a question to the people. An unused initiative and referendum provision in the Wisconsin statutes, believed to be unworkable by most people on account of the large number of signatures required to initiate legislation, was seized upon by advocates of the project, to get around this difficulty. This section provides that the City Council must accept any initiated resolution or ordinance bearing the signature of 15 per cent of the persons voting for Governor at the last general election, or refer it to the voters at the next general election or at a special election called for that purpose, if such election was more than ninety days distant from the time when the initiated ordinance or resolution was presented to the Council.

Accordingly, a petition bearing the proposed ordinance was circulated by the City Club and other civic, labor and party organizations. Twelve thousand five hundred names, three thousand more than necessary, were secured in a period of two weeks. Upon presentation to the Council the initiated civic center ordinance was submitted to the voters at the spring municipal election. The campaign was necessarily brief. Speakers advocating the ordinance addressed every political meeting. Special meetings of the civic associations were called to listen to arguments upon the ordinance, and practically every one of them passed favorable resolutions. A short film explaining the reasons for voting favorably was shown at the leading moving-picture houses. The foreign-language newspapers and two of the English newspapers favored the ordinance; the other two took no part in the campaign. The City Club printed dodgers on the eve of election which were distributed to voters at political meetings and at the polls. There was little active or organized opposition. The official count of the vote was 27,130 ayes, 9,931 noes. The Board of Public Land Commissioners is now taking action to have an architectural survey of the site to determine the proper location of the contemplated public buildings.

At the same time bond issues of $1,000,000 for street widening, and $600,000 for a bridge across the Milwaukee River at Cedar and Biddle Streets were also approved. With this money the city proposes to widen Cedar and Biddle Streets to a width of 150 or 200 feet and build a connecting bridge across the Milwaukee River, thus creating a broad civic plaza, one mile in length, from the civic center to Lake Michigan. The city will use excess condemnation in making this improvement, condemning the property to the alley on one side of the street, and reselling the land which is not needed for business purposes.

The civic center and Cedar-Biddle Street widening projects are only the first steps toward the accomplishment of a general city plan, which is being worked out by the Board of Public Land Commissioners.

The Civic Center Site and Plan

The civic center area is situated in the central portion of the city near the intersection of the main cross-town arterial streets. This is highly important in the case of Milwaukee, as the city is badly divided by rivers and river valleys. The Menomonee Valley separating the west and south sides of the city is over 2,500 feet wide and spanned only in a few places. The project involves the eventual condemnation of approximately eleven city blocks of property with an assessed valuation of over a million dollars, the building of diagonal streets to divert traffic from crossing the civic center tract, and the reduction of grades of the streets in this area, in order to relieve the traffic congestion upon Grand Avenue. As the site is immediately adjacent to the central business district of the city and underdeveloped on account of the excessive grades, it is believed that the development of the project as contemplated will accelerate the development of the entire business district.

It is not contemplated to abandon any existing public buildings, but rather to erect public buildings upon this area as they are needed. The public library-museum building is already included in the site; the auditorium borders it; $350,000 has been included in the 1920 budget for a memorial building, and $250,000 has been added to a similar amount appropriated last year for a central police station. The county decided to build a court house several years ago to replace the present structure, but no money was appropriated, pending agreement upon a site and a decision as to the civic center.

The Town and the Country Are One in Interests

"BEFORE there can be a better organization of country life the villager, or townsman, and the countryman must stop calling each other names and begin to coöperate," declared W. S. Deffenbaugh, Specialist in School Administration, U. S. Bureau of Education, recently in an address at Morgantown, W. Va. His topic was "Types of Villages and Their Relation to the Surrounding Country." Speaking of the rural type, or the town located in the midst of a farming section, he said:

"The townsman and the countryman must learn that they belong to the same community. No one needs to know this more than the townsman, who too often has looked upon the farmer as a mere trader, bank depositor, or spectator at town functions. Lack of coöperation, however, cannot be attributed entirely to the townsman, for the farmer, too, has not been aware of the fact that the town and the surrounding country should be one community. Too often he has thought of the town as a mere trading point in whose welfare it is not necessary to concern himself.

"One reason there has been no coöperation between town and country is because the two have not thought together. One way to bring about coöperation is to bring about community thinking. One school serving as a community center would help do this; that is, if there be developed the type of school which meets the needs of the entire community, and if the school be made the center of all community activities of a recreational, social, and intellectual nature. In brief, the town child and the country child should attend the same school if the town and the surrounding country are to be welded into one community.

"If all the schools within the usual trade area of a town were consolidated at or near the center of every-day business life, the children of this district—town children and country children—would have better educational advantages than they now have. Their vision would become broader. It would no longer be the town child pitted against the country child if it were understood that all belong to the same community and that all have the same interests.

"As already stated, the town and country schools should unite only on condition that the town is willing to join with the country in providing the kind of school the community needs. If the two would do this, it would be possible to build up in the country town the best schools in America. Instead of having weak one-room country schools with a narrow course of study and of having almost equally weak town schools with a bookish course of study borrowed from the cities, it would be possible to teach the town children and the country children those subjects related to the every-day life of the community. Agriculture could be taught in a practical way. In every country town, or at least near to it, grounds suitable for demonstration purposes are obtainable. Boys living on farms could by means of home projects apply the principles of agriculture learned in the classroom and on the school ground demonstration plot. Boys, also girls, living in villages or towns, could have back-yard and vacant-lot gardens under the supervision of one or more of the teachers.

"Why continue to draw a line of cleavage between the town and the country since they are one in interests?"

The New York Community Trust

Created for the Encouragement and Promotion of Gifts for Charitable, Benevolent or Educational Uses

By Frank J. Parsons

Acting Director of the Trust

IN view of the rapid spread of the Community Trust movement, which was inaugurated in Cleveland and is now operative in over thirty cities in the United States, I have been requested to outline briefly the fundamentals underlying such Trust. Altho most of the cities which have organized such trusts are of large population, the plan is applicable to smaller cities, and a description of The New York Community Trust will show the principles common to all such foundations.

The Community Trust differs from the private foundation, such as the Rockefeller Foundation or the Carnegie Foundation, in that the latter reflects the purposes of a single original donor, usually for a specfiic purpose, while the former is founded by the aggregate gifts of the community, for the benefit of the community. Some means had to be provided to secure a committee that would be representative of the community, that would change with the changing times, and in that way reflect the desires and needs of the people of each succeeding generation, and withal would give it a basis and character that would command respect and secure gifts.

As a rule, private bequests, large or small, have a fixed purpose. Funds are often given on the erroneous supposition that charitable needs do not change. A reading of history, on the contrary, indicates that charitable needs are constantly changing, and that it is usually a mistake to give money with the proviso that it must always be used for a certain given object. In the United States, a young country, the situation has not yet become so bad as in England. In that country I found that many of these foundations or trusts with fixed objects had been created in past centuries. Of these, a majority had become abortive, because the object which the donor had had in mind one or two centuries ago had ceased to exist. In many cases the situation had become actually vicious. Parliament finally passed a special act, which only now is laboriously trying to get the money devised to some 40,000 of these foundations back into live and active current charities—an object which would have been accomplished without waste, without expense, and without delay, had the money been given under the Community Trust plan.

The objects of the Trust are outlined in the Preamble to the Resolution and Declaration of Trust creating the New York organization:

> "A plan which shall meet the changing needs of the time for charitable gifts, with flexibility in the power of distribution, and which shall afford an opportunity alike to persons of wealth and persons of moderate means to make their several gifts to different trustees of their own selection, to provide for the selection of beneficiaries of such gifts by impartial persons chosen for their knowledge of the educational, charitable or benevolent needs of the times; and further to provide for safeguarding the permanent security of the principal of the gifts."

This is provided through the medium of trustees, to whom these gifts are made in trust for The New York Community Trust. Under the plan, any trust company or any national or state bank having trust powers may by the adoption of a common resolution and by an affirmative vote of the existing group, become a trustee and qualify to receive bequests. These institutions are represented on the Trustees' Committee, each company having a representative and one vote, with an additional vote for each $10,000 of certified income available for the use of the Trust. Among other duties, this Trustees' Committee has the power of choosing five members for the Committee of Distribution.

The Committee of Distribution is charged with the direction of all disbursements under the Trust. It is composed of eleven members, five chosen by the Trustees' Committee, as stated, and six selected by "public sources of appointment" representing as nearly as possible permanent institutions. In New York these six are selected by the following persons:

One by the President of the Chamber of Commerce of the State of New York
One by the Mayor of New York City
One by the President of the New York Academy of Medicine
One by the President of the Association of the Bar of the City of New York
One by the President of the Board of Trustees of the Brooklyn Institute of Arts and Sciences
One by the Senior Circuit Judge of the United States Circuit Court of Appeals, for the Second Circuit.

These people meet together in conference and select six members. It is obvious that it would have been difficult to find "public sources of appointment" more truly and permanently representative of the people of New York than the six named.

It is not desired that the Committee of Distribution shall build up an elaborate organization. The following is an interesting paragraph indicative of the spirit which it is hoped will prevail:

> "The said committee shall, as a rule of action, as far as possible carry on its investigations through existing agencies or through specially appointed temporary committees or agents and shall avoid bureaucracy and complicated machinery and consequent expense."

Much will depend on the care with which the members of the Committee of Distribution are selected. It is probable that the great majority of community trusts, while assured of considerable sums in the future, must commend themselves to the community at this time by what is done in the early stages of development. It will be better to lay a careful foundation and move slowly, however.

In this connection it is pointed out that one of the wisest and most useful things which could be done at the beginning is an appraisal of the social resources of the community. This has been done in Cleveland, and elsewhere. In Cleveland there has been pledged under living trusts and under wills —some of which, it is true will not be available for the Community Trust for 50 or 75 years—upwards of $100,000,000. Think of that amount and the income from it, which, if wisely distributed, should result in tremendous good to the community. One cannot put too much stress upon the wisdom of laying foundations for the handling of such a vast sum for such purposes, always keeping in mind that the wisest philanthropy is that which will eventually make "charity" unnecessary.

One of the fundamentals underlying the plan is that if it is desired to leave a sum of money to an existing charity that is worthy to-day, we may do so, and at the same time take advantage of the broad powers underlying the trust, to divert the income to a live public charity, if the original purpose no longer serves a real public need. This may not appeal to some people. They may say, "I think I am better able to judge the needs of the future than a public committee of any sort." A man who reasons that way has not read history to any advantage. In time his charity will become abortive, and will do nothing more useful than to endow a clerical force. There are in this country plenty of cases that show the folly of giving money under trust to fixed objects. For instance, there is something like $3,000,000 now on deposit in a St. Louis trust company, given by a well-meaning Irishman named Mullanphy who thought he was doing something original. When a young man, he had had a hard time in crossing the Great American Desert, and had almost lost his life, and he made up his mind that he would see to it that none of his fellow-countrymen had the same trouble. He therefore left this large sum, the income from which cannot be used for any other purpose than to assist worthy fellow-Irishmen in their journeys across the Desert. As you may imagine, the money is not doing much good.

In his day, Franklin was as wise and far-seeing as any man. But he failed to forecast the future. Under the provisions of his will, a considerable sum of his money was to be used for piping the waters of a little creek to supply drinking water for the inhabitants of Philadelphia. In the first place, the Board of Health would probably not allow the use of this stream to-day, and in any event the supply would not meet the present needs of Philadelphia for an hour.

We must trust the future and not feel that virtue and knowledge die with us. The business side of it, the selfish side, if you please, must be subordinated, and we, as financial men, must act with donors, from the standpoint of a great community trust, for the benefit of the charities and of the community.

The Zoning of Apartment and Tenement Houses

An Important Legal Decision Which Will Help to Preserve Our American Cities as Cities of Homes

By Robert H. Whitten
Advisor, Cleveland City Plan Commission

ONE of the big problems of zoning is to preserve our American cities as cities of homes. This cannot be done unless some limits are placed on the spread of the apartment house. The tendency in most large cities for a larger and larger proportion of the population to be housed in tenements is very marked. Census statistics for 1900 show for the borough of Manhattan 88 per cent of the population living in tenement houses. For New York City as a whole the percentage was 71, for the borough of Brooklyn 57, for the borough of the Bronx 53, for Chicago 42, for Boston 41, and for Cleveland 13. Observation and such statistics as are available indicate that in all these communities the proportion of the population living in tenements is rapidly increasing. With an increased population, all these communities seem destined to become just as distinctly tenement cities as is the borough of Manhattan, where over five-sixths of the people live in tenements.

The general trend is not only toward a decrease in the proportion of the population housed in one- or two-family houses, but a gradual increase in the number of floors in the tenement house and a marked decrease in the size of the rooms and in the number of rooms per apartment. In the borough of Brooklyn, New York, while a few years ago a large proportion of the new houses built were two-family houses, now there are almost no new buildings of that character. In their place three- or four-story tenements are being built. While a few years ago there were many two- and three-story tenements being built, now most of these buildings are of the four-story type, while in certain sections the five- and six-story tenement is increasing rapidly. There is a continual tendency toward increased intensity of building construction, and the more congested sections are those in which this tendency is most noticeable. Congestion breeds congestion.

While the borough of Manhattan is a city of tenements, and the lower East Side the most congested area in the world, the city as a whole is not densely populated. In 1910 New York City had on the average only 26 people to the acre. Beyond a 6-mile radius from the City Hall there are enormous areas in the boroughs of the Bronx, Queens, Brooklyn and Richmond that are very thinly populated. With a proper transit system and a proper distribution of industry and of housing, the extreme congestion of population and industry on Manhattan Island would be entirely unnecessary. It is the province of zoning so to control the housing and industrial development that these evils will not be repeated in other cities.

The apartment house and the one- or two-family house cannot exist side by side. The erection of a single apartment house in a block is almost certain to mean a radical change in the residential population, a decline in the value of the single-family houses, and a gradual replacement of such houses by apartment houses. The reason for this is obvious. The quiet, seclusion, outlook and attractiveness of the block from the point of view of the home owner is destroyed. The apartment house cuts off light and air from neighboring homes. It may tower above the neighboring private house and project beyond the established building line in the front or in the rear, or both. Attractive surroundings, a good outlook, are important elements in creating good home conditions. Most of the value of the private home is destroyed if surrounded by the high, blank walls of apartment houses. The walls of the apartment not only cut off outlook which is essential to comfort and vitality, but they also cut off air circulation and sunlight which is essential to health and comfort in a much more direct and unmistakable way.

The apartment house is very well suited to the housing of adults. It is not well suited to the rearing of children. From the nature of the case, children are a nuisance in an apartment house, and the apartment house is an injury to the children. The prejudice against renting apartments to families with children is well founded. Any sixteen-family apartment with three or four children per family is bound to lack all the desirable characteristics of a home either for adults or for children. The noise from neighboring apartments, the children swarming in halls, stairways, courts and sidewalks, the general confusion and untidiness, the increased danger from all sorts of communicable disease, make life in such a place much less worth while than it should be. The vitality, efficiency and morale of the race cannot be long maintained if the major portion of the people of our cities must grow up under such conditions of overcrowding.

No one will question the desirability under a zone plan of establishing districts that will be restricted against the coming of the apartment house. The question is whether such a restriction can be sustained as a reasonable exercise of the police power. Judge Kramer in a recent decision holds that this can be accomplished. The case of Max Morris vs. C. M. Osborne, City Manager of the city of East Cleveland, decided April 30, 1920, involves the constitutionality of that portion of the zoning ordinance of the city of East Cleveland which prohibits the erection of apartment houses in certain sections of the city. The decision rests squarely upon the constitutionality of the ordinance. Judge Kramer refers to the fact that with the progress of civilization, courts have been asked to pass upon the validity of each new exercise or extension of the power of the legislature to restrict the use of private property. He says:

"No one, to-day, I take it, would question the right of a municipality, under its police power, lawfully to limit to certain districts slaughter-houses, corrals, livery stables, laundries, carpet-beating establishments, etc. Not only would we consider that there was no question that this might lawfully be done, but we would consider that there never could have been any question that it could be done. Yet the books disclose that the validity of the laws so limiting these industries were attacked in the courts upon precisely the same grounds as are urged against the ordinance here in question. The law, as laid down in those cases, is precisely the same as it is held to-day. The law has not changed, but the application of the law has kept pace with changed conditions—conditions both material and of public thought. These conditions have so changed, since it was considered the right of the state to interfere with the use of private property, even to the extent of limiting its use, as a slaughter-house, was debatable, that it is now held that regulations limiting the height of buildings, the material to be used in their construction, and all of the other minute limitations of building ordinances, fire district ordinances, etc., are too well established to be questioned.

"The development in the application of the law, in this regard, has been in sympathy with the change which has taken place generally from the conception that the law should jealously guard the right of the individual to use his property as he saw fit, subject only to the condition that he did not maintain a public nuisance thereon, to the conception that the state or community has a very definite interest in the use of private property, and that the use of such property may be very broadly limited in the interests of the community in general."

After taking this forward-looking view of the development of the police power, Judge Kramer finds that for many reasons it is desirable under present-day city conditions to regulate the location of apartment houses. To quote him further:

"It would seem that there could be no two opinions upon the proposition that the apartment house, or tenement, in a section of private residences, is a nuisance to those in its immediate vicinity. Under the evidence, and as a matter of common knowledge, of which the court may take judicial notice (16 Cyc. 582), it shuts off the light and air from its neighbors, it invades their privacy, it spreads smoke and soot throughout the neighborhood. The noise of constant deliveries is almost continuous. The fire hazard is recognized to be increased. The number of people passing in and out render immoral practices therein more difficult of detection and suppression. The light, air and ventilation are necessarily limited, from the nature of its construction. The danger of the spread of infectious disease is undoubtedly increased, however little, where a number of families use a common hallway and common front and rear stairways.

"The erection of one apartment house in a district of private homes would seriously affect only those persons living in the immediate vicinity thereof, but the common experience is that the erection of one apartment drives out the single residences adjacent thereto, to make way for more apartments. The result is that, in time, and not a very great time, when one apartment is erected the whole street is given over largely to apartment houses.

"With the growth of its population, it appears to be practically certain that unless restricted, the greater part of East Cleveland will be built up with apartments, and the home owners must choose either to adopt apartment life or abandon their depreciated property and move out of the city or into its more remote parts.

"If the claim of the relator here is sound, a city of private homes, grass plots, trees and open spaces, with the civic pride and quality of citizenship which is usually found in such circumstances, is powerless to protect itself against the obliteration of its private residence districts, by apartments, which shut out the sun and sky from its streets and one another, and are generally owned by those whose greatest interest is in the revenue that the building will produce. If such is the law, it must be conceded that it is unfortunate.

"The apartment house is, for many, a desirable convenience, and, for some, a necessity. They are a recognized necessity in cities of any size. Their erection should not be prohibited, and under this ordinance are not prohibited. Private residences, with yards for play spaces, with grass, trees and flowers, are necessities for people with children, and as much a convenience to the people without children who take an old-fashioned pride in owning their homes, as is the apartment to those who are willing to accept its restrictions, for its compensatory freedom from responsibilities. It is at least as important to the community to preserve the private home for this class as it is to provide the apartment for the first. Under this zoning ordinance the private home is preserved and the apartment house is provided.

"It seems eminently fair to restrict the apartment builder to a limited area, where his use of his property will do the least damage to others and to the community. The necessities or convenience of those who live in them will be served thus with the least sacrifice of the necessities and conveniences of others. Whatever of the burden arising from apartments there is will be borne by those whose purposes they serve, and not shifted to the other property owners of the city to make their property unfit for use as homes.

"This court is therefore of the opinion, first, that the ordinance here in question is a valid exercise of the police power by the city of East Cleveland, under the authority of its charter; second, that it has not been shown that the classifications made under this ordinance are unreasonable, arbitrary, discriminatory and not uniform in operation."

Judge Kramer goes to the heart of the matter in the statement that "the greater the proportion of private homes in a city, preferably occupied by the owners, the better the city, in health, morals, peace and welfare," and concludes that "it is within the police power of a city to preserve districts against the apartment."

Unthanked Servants

I wish it were possible for the public to speak more directly to those who represent it in public life. We are a great people for organizations, but we are one organization short. We have clubs, societies, fellowships, lodges, services, unions, federations, fraternities without number. No other hundred million people that ever lived have been so unionized for one purpose or another, but we need one more. Where is our League of Appreciation?

When a man does a fine thing in public life we should let him know that we appreciate it. There should be a common understanding that when a man performs his duty he should get more compensation than his salary or his own self-approval.

If democracy is to be a success, we must stimulate in every possible way the courage, the constructiveness and sober wisdom of our officials. Honesty is not a rare virtue in public men, but courage is, because men soon find that by a conciliation of antagonistic force they go far. The "pussyfooter," the evader, the responsibility shirker, the passer of the buck in ordinary times is a successful man in politics. And when society finds a man who shows nerve he should be promoted. But his nerve should be linked with sanity. We should not mistake hysterical obsession for constructive statesmanship. The reason that so many palaverers go so far is that their only opponents who have courage are unbalanced extremists, who feel right but who wish to take a mountain at one leap.

My appeal is on behalf of those steady-minded men of vision who push off with one hand the corrupting forces that attempt to sway their official action by bribes given to their vanity or their ambition, and with the other arm draw toward them those who plan purposely and practically for improvement.

The forces of malevolence, the destructive forces, have their agencies constantly at work. They insinuate and intimidate. Why should not the constructive forces be equally alert and assert themselves in the promotion of honesty and courage in our public men?—*Franklin K. Lane, former Secretary of the Interior.*

The County Forest That Surrounds Chicago

By Peter Reinberg

President, Board of Forest Preserve Commissioners of Cook County, Ill.

DURING 1920 Cook County, Ill., will spend $1,250,000 for the general improvement and maintenance of its Forest Preserve. This Preserve has been extended until it now covers nearly 15,000 acres, girdling Chicago, and extending from end to end of Cook County. Its popularity has grown steadily, and during the past year more than 1,500,000 persons visited the park—a figure four times as large as for the preceding year. Within the same period, more than 1,100 camping permits were issued, three times as many as in 1918. These figures prove that the people of Cook County appreciate their Preserve, and their appreciation is attested by the large sum they have authorized to be expended upon it.

The Preserve now actually owns 15,994.10 acres, acquired at a cost of $5,957,302.38, out of an estimated total of 30,000 acres in the county suitable for conservation purposes. The Board of Commissioners has been signally successful in popularizing the beauties, comforts, and advantages of the Preserve. Every day brings new demands for information regarding it. Women's clubs, fraternal and social organizations have been found to be effective publicists. School children are showing lively interest in the Preserve, and the Chicago Board of Education is planning a series of stereopticon lectures to foster this enthusiasm. Students of local history have been particularly attracted to the Preserve, where a number of Indian trails can still be traced.

During the past year five major construction projects were carried on, including a three-span reinforced concrete bridge and a considerable amount of paving. The second of a series of dams in the Desplaines River was completed, backing the water up to the first of these barriers. These dams, by raising the water levels, promise to make the stream available for boating, fishing and swimming. Above the new dam is a swimming hole with a sloping, sandy shore

IN THE HEART OF THE FOREST PRESERVE OF COOK COUNTY, ILL.

A GROUP OF MOTHERS AND CHILDREN FROM CHICAGO'S CONGESTED DISTRICTS ENJOYING A TWO-WEEKS OUTING, GIVEN GRATUITOUSLY BY COOK COUNTY AT CAMP REINBERG IN THE FOREST PRESERVE

equal to any bathing beach. These improvements promise to eliminate stagnant pools due to low water in summer, to abate any dangers due to inadequate sewage dilution during the same period, and to make the river available for boating at all times. The increased volume of water should at the same time benefit adjacent forests.

As urged by devotees of the game, the Commissioners have provided golf links for the people. One 18-hole course is ready, which golf experts declare easily surpasses any of the public courses now in use in Cook County, because of its natural beauty and the character of the ground on which it is laid out. Another 9-hole course has been acquired and opened, and during the year another may be laid out. Owing to the popularity of the game, and the congestion of the public links in the city parks, these courses are expected to attract hosts of players.

Another interesting feature of the Preserve is the flock of 370 sheep. During the past year nearly 300 sheep and lambs were shipped to contribute to the provisioning of Cook County's Infirmary and Tuberculosis Hospital. The sheep were originally procured chiefly for conservation purposes. There are tracts where growths of briars, burrs, and weeds make portions inaccessible, choke desirable vegetation, and provide material for dangerous fires. In such spots moderate grazing is a factor for good. Also, the wool clip yielded by the flock for the year brought in $1,591.74.

For this year, in addition to the golf courses mentioned above, the Commissioners have provided for five more baseball diamonds and half a dozen additional tennis courts. Sprinters from public schools and athletic clubs will find two new running tracks; for Boy Scouts and Forest Rangers nine log cabins will be built. Twenty miles of new roads will be constructed and nine parking courses for automobiles will be laid out. The Commissioners are confident that 1920 will be the most successful year in the history of the Preserve.

Mrs. Harold F. McCormick, of Chicago, has generously donated a tract of 300 acres, on which it is planned to build the greatest zoological gardens in the world.

Many social welfare camps are being conducted in the Preserve this summer, including Camp Reinberg, which is directed by the county authorities. At this camp ten different groups, each of almost 400 wearied mothers and children from Chicago's congested districts, will be housed for outings of a fortnight for each group.

Editorial Note.—See also "County Forests for Citizens," in The American City for May, 1917, page 519.

A Village Hall from Surplus Funds

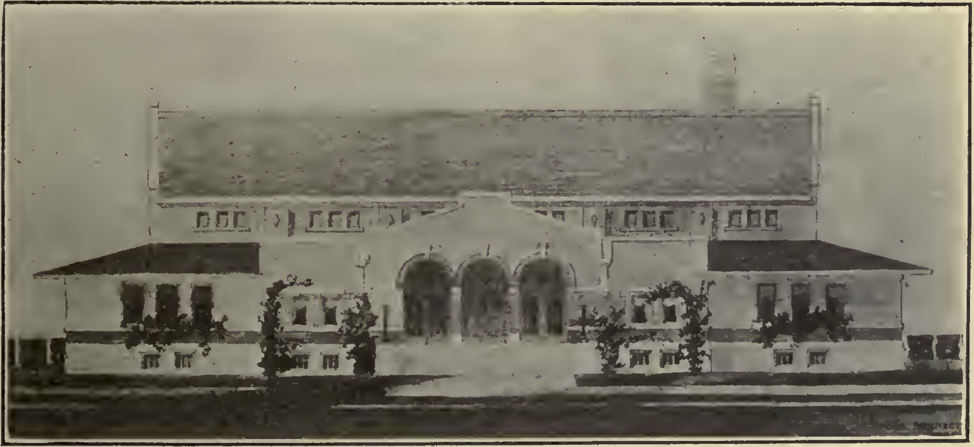
How Biron, Wis., is Meeting an Unusual Situation

By F. H. Eberhardt

THE village of Biron is located about three miles from the city of Grand Rapids, Wis., and has a population of about 300. All the men in the village are employed at the paper mill operated by the Consolidated Water Power and Paper Company. This company owns 97 per cent of the assessed property within the village, and during the last few years has paid an income tax upon its earnings from the mill, the village share of which is more than sufficient to cover all the local expenses, and which consequently leaves a substantial surplus. The village owns and controls its water and lighting system, has paved streets, a sewerage system, sidewalks, and a large modern public school.

The matter of building a small village hall was at first taken up by the Village Board about a year ago. George M. Mead, manager and president of the Power and Paper Company, heard of the plans for a village hall and immediately consulted with the Village Board and suggested that the village enlarge its plans to the extent of erecting something which would be beneficial to the entire community. This idea was developed, and with the aid of Auler & Jensen, architects, of Oshkosh, plans were soon made.

A place where public meetings might be held was the foremost thought in mind, and with that end in view it was planned to center the auditorium within the other parts of the building. The auditorium is 45 by 70 feet and is arranged to serve as a gymnasium also, having dressing-rooms and shower baths for both men and women. A small stage at one end, together with motion picture equipment, provides for local entertainments.



THE COMMUNITY HOUSE IN BIRON, WIS.

A bowling-alley, a billiard-room, and a small kitchen are also located on the lower floor. The upper floor is divided into reading-room, lobby or lounging-room, ladies' parlor, council chamber and toilet rooms. A balcony extends around three sides of the auditorium, so that the entire floor space of the large room may be utilized for dancing or athletic games.

The building resembles a large bungalow and is constructed of stucco over tile and brick.

Rat-Proofing as an Anti-Plague Measure

By E. G. Eggert

Sanitary Engineer, State Board of Health of Texas

Editorial Note:—*The fact that extreme precautions are now being exercised at all ports of the United States, and particularly in the South, against the attacks of that insidious disease, bubonic plague, the host of which is the rat, makes the following article of particular interest and value to all cities having facilities for shipping by water. Should this plague gain entrance in any considerable measure to the United States, it might prove one of the greatest menaces to life throughout the country. Municipal officials will do well to carefully study the rat-proofing methods described in this article, and to confer with the local and state health authorities as to ways and means for protecting each particular city.*

THE prerequisite to successful rat-proofing is to exclude the rodent from his food supply and make conditions unfavorable for breeding and harborage. Rat destruction in a community can be satisfactorily accomplished only by the concerted effort of the municipal government and its citizens. Individual and intermittent action is found to be more or less temporary and decidedly unsatisfactory. General regulations and ordinances on rat-proofing and anti-rat measures must be created and enforced. The municipal authorities must render all possible assistance in applying these stipulations.

To merely kill rats by poisoning and trapping, or to clean premises and remove rubbish without rat-proofing, will result in little good, as rats usually prefer more secure harborage, such as that between walls, under floors and in attics. To render a structure rat-proof for practical purposes, it should be built of material impervious to rats, from basement to roof. All accidental and unnecessary openings should be permanently closed, and all natural openings should be provided with close-fitting and securely placed doors, windows or screens.

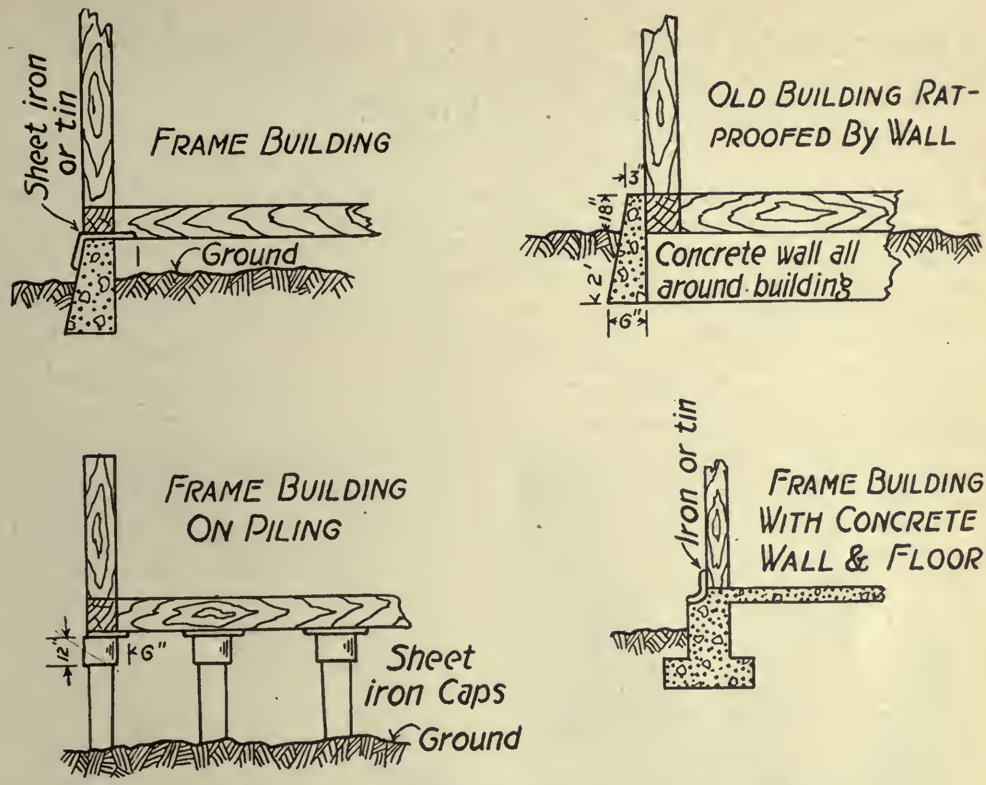
The following areas should be carefully considered in rat-proof constructions: foundations, basements, footings, walls, ceilings, windows, doors, roof, attic, ventilators, skylights, flues, down-spouts, conduits, piping, sewers, grease-traps, catch-basins, air and light shafts.

In new building construction the framing should be placed on a brick or concrete foundation. The foundation should be a continuous wall around the entire structure, not less than 6 inches thick and not less than 18 inches below the ground, extending upward flush with top of floor joist or bottom of flooring. The top of this footing should at no point be less than 18 inches above the surrounding ground surface.

Any structure which is used for the sale or storing or manufacture of foodstuffs either for man or animal should have the full floor area covered by concrete not less than 3 inches thick. Also, all buildings which have a floor level below the lowest adjoining street should be similarly covered with a 3-inch concrete floor. Any openings made into the foundation wall to admit plumbing should immediately be closed with cement to the full depth of the wall.

All openings left for ventilation should be carefully screened with iron gratings or have wire not over ½-inch mesh. All floors and ceilings which it is not practical to construct of concrete or brick should be composed of a double layer of 1-inch tongue-and-groove lumber driven up tight, lined with a layer of galvanized iron wire cloth of 20-gauge and not more than ½-inch mesh. This wire cloth should extend up the side walls not less than 9 inches and should be covered by the baseboard.

When expense will not permit the construction of concrete or brick foundation walls as described, rat-proofing of frame structures may be accomplished in a less satisfactory way by elevating them on piers or piling. In this case underpinning and supports must all be girded with strips of sheet iron not less than 12 inches wide, in addition to a sheet of the same metal covering the top of the support and extending not less than 6 inches beyond the edge. It is essential also that the ground area beneath the elevated structure be kept clear at all times of lumber, boxes and débris. Double ceilings in basements should be avoided if possible. All roof openings



METHODS OF RAT-PROOFING NEW AND OLD BUILDINGS

should be given detailed attention; ventilators, skylights, scuttle holes, chimney openings, etc., should be screened with galvanized iron wire cloth of no more than ½-inch mesh.

The foregoing specifications apply also to the remodeling of existing structures in rendering them rat-proof.

Porches and steps should be given the same careful attention, and made rat-proof. Wooden floors for outhouses, yard coverings, sidewalks, etc., lying in close proximity to the ground should be replaced with gravel, cinders or cement, or left entirely bare. All garbage depositions should be rat-proofed. They should be of metal, preferably a galvanized-iron can, securely covered and water-tight. Such domestic animals as pigs, goats and chickens should not be permitted within the city limits, unless their area be made rat-proof. This may be accomplished by constructing a concrete wall at the periphery, not less than 2 feet below the surface of the ground, with wire netting covering both sides and top of the area.

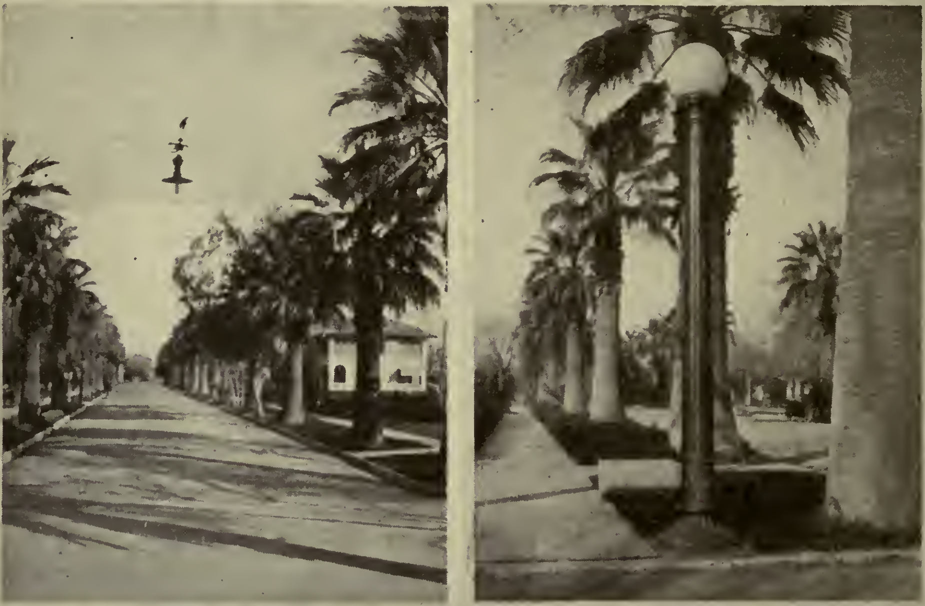
Experts Aid in War on Rats

The health authorities of the city of Cincinnati have secured the aid of the Biological Survey of the United States Department of Agriculture in planning the details of a city-wide drive to exterminate rats. The methods of poisoning and trapping the animals recommended by the department's men who have specialized in work of this sort will be followed very largely. The city has been divided into districts, in each of which a door-to-door canvass will be made to bring home to all occupants of houses, factories, stores, etc., the importance of coöperating in this important movement. A large amount of literature prepared by the department, dealing with rat extermination, will be distributed during the campaign. Special emphasis will be laid on the fact that rats are carriers of disease and are particularly apt to contaminate human food wherever it is accessible.

The Street Lighting of Phoenix, Arizona

By A. S. Gregory

THREE types of street lights are in use in Phoenix, Ariz., namely, 110-volt multiple lights, 6.6-ampere series incandescent lights, and arc lights. The main business section is lighted by five-light electroliers set opposite on both sides of the street and spaced about 112 feet apart. The posts are 13 feet high, and average four to the block. Each post is supplied with 110 volts and equipped with nitrogen lamps, 60 watts on top and 40 watts in the brackets. The lights in the brackets are switched off at 10 P. M., and the top lamp is left burning all night.



TYPES OF LIGHTING STANDARDS AND PENDANT FIXTURES USED IN PHOENIX, ARIZ.

The wiring for the posts is carried underground in fibre conduit and consists of three-conductor, varnished-cambric, lead-covered cable. There are 260 such posts in operation, fed from four sets of transformers. The 110-volt wires from each set of transformers are carried into a manhole in which are placed fuses and switches for local switching or testing in case of trouble. Each manhole contains two switches which divide the 260 posts into eight circuits. A 2,300-volt primary feed supplies the four sets of transformers, and the whole system is controlled by the primary switches at the power house.

Lamp renewals for each post average about $1.40 a year. Each post consumes 220 watts an hour and gives out a 140-candle-power light.

The series incandescent system is composed of about 400 single ornamental standards distributed in the residence districts and boulevards adjacent to the business section. They are set three to the block on each side of the street, opposite each other. Ordinarily they are equipped with 100-candle-power, 6.6-ampere nitrogen gas-filled lamps and are wired in series. In order to illuminate some streets more brightly, the poles are equipped with 250-candle-power lamps. These circuits are arranged so that each alternate post can be switched off for the night. The system is divided into several circuits in order to facilitate the location of trouble, and also to avoid dangerous voltage, which would exist with too many lamps in series, as the voltage on a series circuit is equal to the combined voltage of all the lamps in series. Each circuit is provided with its own transformer, which supplies constant current at 6.6 amperes at a voltage proportional to the number of lamps in series. The transformer is of a special type made to mount on a pole the same as an ordinary transformer. It has no movable parts and is efficient for this type of work, although the power factor is low.

Fibre conduit is not used on this system for the cable, but a double steel-armored cable is laid directly in a trench. The cable consists of a Number 6 copper conductor insulated with 3/32-inch of varnished cambric which is incased in a lead sheath 1/16-inch thick. The lead is covered with a layer of saturated jute, which is then covered with double steel armor, and the whole again covered with jute. The cable was built for a pressure of 2,000 volts.

When a lamp burns out on a series system, some means must be provided to close the circuit in order to keep the other lamps in the series burning. There are several ways of arranging for this. Where many large units are to be installed, perhaps the best method is the use of small transformers for each lamp unit. However, this would require a large initial expenditure. Phoenix has obtained much satisfaction with the use of ordinary series sockets and receptacles with disc cut-outs which puncture and close the circuit when a lamp burns out.

The advantages of the series system over the multiple system is in the saving of copper conductors in covering a given area, and in the lower voltage lamps, which reduce the annual bill for lamp renewals. The present cost is about $1 for each pole. Arc lights are used in the outlying residence and suburban districts.

Nitrogen gas-filled lamps have been found the most satisfactory in Phoenix; 100-candle-power lamps consume only 70 watts an hour, and 250-candle-power lamps about 165, while the ordinary lamps which are used on the cluster posts furnish only about 140 candle-power with a consumption of 220 watts an hour.

HYDROGRAPHIC SURVEY BY CINCINNATI ENGINEERING DEPARTMENT—MORE COMFORTABLE WORK IN SUMMER THAN IN WINTER

Teach Proprietorship in Public Parks

This, Rather than Police Protection, is Claimed to be the Cure for Misuse of the People's Own Possessions

By Maurice F. Duhamel

CONVINCE your people that they are the real owners of parks and public places. Give them a true knowledge of the value of this property. Confirm them in the responsibilities of this custodianship, and there you have the cure for all the carelessness and vandalism of which such property is the victim.

Rather a sweeping statement, this, but not more difficult to support than the average claim for the benefits of civic education. A part of its proof is to be found in the very fact that the people of all cities are willing to give liberally of the means to procure and maintain parks, playgrounds, public gardens and other similar institutions. These same citizens pretty generally are quite as anxious to preserve such property, but it too frequently happens that they never gain the feeling of proprietorship essential to personal interest in the subject. In contrast to their willingness to be taxed for the purchase of such property is their hostility to high assessment for its up-keep, either in the form of incessant repairs or excessive policing costs.

And yet, the latter demand upon the people is the one of which we hear most frequently. We have the word of a park commissioner* that, lacking a powerful park police force, he is helpless to protect a vast acreage of incalculably valuable recreation space—one of the best known places of the kind in America. I went through this great park recently and saw that what he said was quite true. There were many evidences of a lack of respect for the property, many evidences of vandalism and carelessness. But I think I saw, also, some reasons why such conditions obtained.

Not in all the hundreds of acres of this wonderful park, nor in all the great borough in which it is situated, did I find the faintest evidence that there ever had been any effort to incalculate in the minds of users of the place any idea of its usefulness, its importance, its beauties. Not a trace existed of any manner of effort to "sell" the value of this fine city institution to those who own it—the common people.

Now a park, figuratively, is something like a church. Nobody owns either—we all own both, so to speak. But, for some strange reason, there will be vandalism in a park right next door to a church edifice which will never be molested. The "strange reason" is—education to a respect for the church property, begun early in human development and carried on progressively. It seems that respect for church property is easy to teach, easy to acquire.

How many American cities are engaged this spring in a brief, intensive campaign to educate their citizens, old and young, to respect park property? Perhaps here and there one or two. More likely none. In most of those communities where such property suffered last summer from vandalism, cries were raised for stronger policing. Force was implored to assume tasks rightfully belonging to education. My conclusions as to this phase of protecting park property are that merely policing a park will not wholly protect it from vandalism. The presence of a police officer in a place designed for free public enjoyment instils in some minds the resentful thought that he is there to curb their liberties, as the agent of some absentee dictator. I favor the viewpoint that the intelligent administration of our parks and other public places must begin and remain, not in the police department, not in the legislature as a body empowered to exercise force, but in our educational institutions, academic and civic, our schools and our public forums.

It may be easier to hire policemen to guard parks, but it is more practical and less expensive, more resultful in the long run, and far better for us, to have our educators, by object lessons and moral suasion, strive to remove the necessity for forcibly protecting such property. The policing power of intelligence, of common sense in the individual, to my mind, is a highly satisfactory influence. To be forever hiring more policemen does not, it might be claimed, represent the right brand of American progress.

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* See THE AMERICAN CITY, June, 1920, page 579.

Neither child nor adult will wittingly destroy or injure that which he understands, enjoys and finds useful and beneficial. How best to impart this understanding to communities depends somewhat upon local conditions, but there are certain principles which may be followed, and, in any case, the exercise of a little patient study will reveal the method.

Having for several school terms directed a particular appeal to some thousands of young student minds in a rather efficient manner, I am satisfied that there is no sensible, interesting message to which these minds are not wide open. I should not hesitate, during any early springtime, to undertake an educational campaign among the whole citizenship of any community which virtually would insure a season of absolute security from depredations in parks, playgrounds, public gardens and other such places. I should not, of course, by such methods attempt to reform those few depraved persons who sometimes inflict their actions upon both parks and their users. That is another consideration.

The Springtime Appeal

There is a season in each year at the coming of which human thought reaches to the out-of-doors. It is at this time that the process must begin to develop. In the language of marketing—and this is marketing an idea—that is the buying season. There is demand for out-of-doors. It seems very desirable to be out upon the boulevards, in the parks, and along the sunshiny roads. No person, at that period, is careless of park property. There is no vandalism. The virgin spring is inviolate. What a time to tell everybody in a community that the God-given trees, the budding brush, the sprouting plants, the greening lawns, all belong to them! We all know the mediums to employ, beginning with the public (and public-spirited) press, and going through school classrooms, to the very parks themselves, perhaps with an inspiring, climactic assembly upon Arbor Day.

The spoken word ought not to be relied upon entirely. Prize essays should be encouraged, lectures attended and reported, and a generous supply of brief, well-written literature given wide circulation, with the appeal keyed to all degrees of intelligence. Some persons find their inspiration for good in poetry, some in prose, some in pictures, some in carefully stated propositions associating ideas. Of course, children and adults know all about parks—that is, they think they do—until along comes a thought that changes all their ideas. I offer this one, for its inspirational value:

MOTHERS
Use This Park

Every fair day, in great numbers, they come here to rest, to bask in the sunshine or to compose themselves in the shade.

This park heals their ills and enables them to be better mothers to better children.

And they bring their young—your sons and daughters and brothers and sisters—here to play; to frolic upon the soft lawns, away from the blistering pavements; to be filled with innocent delight at the beauty and fragrance of the flowers.

Respect this park. It is your own, a part of your home and a factor in your healthy, happy family life.

Perhaps such a placard as this, suitably printed and ingeniously placed, might strike down a vandal hand:

THIS TREE!

This is just a common Maple Tree. But it is one of man's most valuable friends.

It is 55 years old. If well cared for it will stand upon this spot, giving its grateful shade and swaying its generous arms, for perhaps 100 years.

If mistreated, if neglected, it soon will die, root by root, branch by branch, and be, before long, of use to nobody.

A Maple Tree asks nothing of man but to be left unhurt, free to draw its life and vigor from the sunshine, the rain and the good air.

Help This Maple Tree
to Live and Serve!

To permit your children to engage in writing such essays as this will be to heighten not only their personal interest but their sense of proprietorship. And perhaps in the process some such epic as the following, penned by an eighth grade public

SUCH PUBLIC AREAS AS THIS SHOULD STIMULATE THE PEOPLE'S SENSE OF PROPRIETORSHIP

Deering Oaks, the largest park area in Portland, Maine

school pupil in a Western city, will be given life:

TREES AND CIVILIZATION

References to trees, to plants, to gardens, occur in all writing from the dawn of intelligence.

Trees are the Kings of earth's vegetation. They are God's most generous gift to men. Some of them are sent to stand and serve; some to prostrate themselves before us and be trodden upon in our useful occupations; some to be hewn and cut and ground into objects of hourly utility.

All trees, all plants, all flowers have their missions upon the earth. We need but to know this and all vandalism against such gifts of God will be abated without further necessity of recourse to police authority.

The consistent execution of an educational campaign of the nature I have in mind would save any considerable community many thousands of dollars. I do not urge that it be attempted without any appropriation of funds, for propaganda among citizens, for printing expenses, and for prizes—even for the purchase of some trees, plants, shrubbery or other such property, to stir interest; on the contrary, it ought not to be attempted at all if there is not at least several hundred dollars available to finance it through.

But since it is constructive, educational work, it ought to be done thoroughly, by fully capable committees under a leader well versed in child and adult psychology. Otherwise it would be about as effective as the ordinary "keep off the grass" sign which nobody nowadays minds.

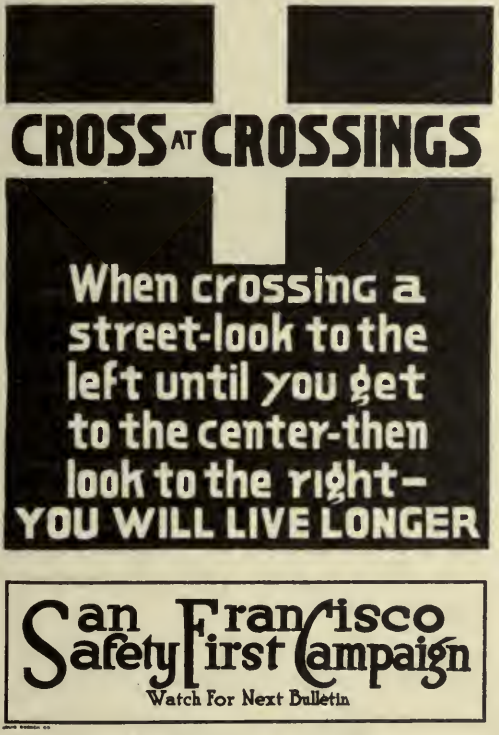
> To improve or reform the layout of most American cities is a great public need, not only for beauty's sake, but for the sake of the health, efficiency and happiness of their people.—*Charles W. Eliot.*

The Human-Interest Safety First Campaign in San Francisco

By A. McKie Donnan

DURING the two weeks April 1 to 14, 1920, no accidents which resulted in serious injury or death occurred in the city of San Francisco. This statement is, of itself, proof of how well the National Safety First Campaign was taken care of locally in this city.

When the national movement was planned, Mayor James Rolph, Jr., of San Francisco, appointed a committee to stage the campaign locally during the two weeks designated. This general committee had one meeting, and, while it continued to exist after this meeting, the campaign activities centered in the offices of the San Francisco Advertising Club, and all duties were arranged by committee men working from that office.



CROSS AT CROSSINGS

When crossing a street-look to the left until you get to the center-then look to the right-YOU WILL LIVE LONGER

San Francisco Safety First Campaign

Watch For Next Bulletin

AN EFFECTIVE POSTER

The Advertising Club has become the work organization for such movements, simply because of its willingness to participate in them. The majority of similar activities which take place in San Francisco are handled by this club, even though such work is somewhat out of the regular scope of the club.

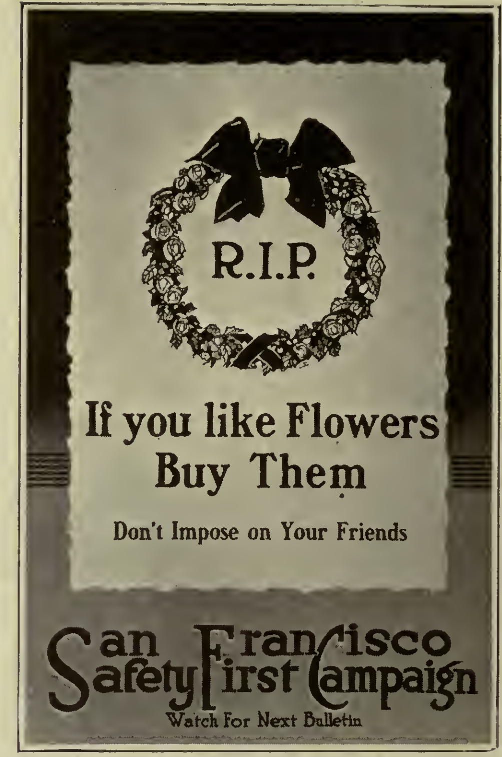
The campaign was, from comparison with reports gathered from all over the country, one of the most comprehensive and complete ever carried on. Its central feature was a series of fifteen posters which were put up, a new one each day, in street cars, store windows, factories, offices, schoolrooms and other places. The theme of these posters, a bit unusual, was keyed to strike the human interest. The copy of one ran: "When you are in the Morgue, it is of little importance to you whose fault it was." Another one: "The judge may fine the autoist, but that doesn't pay the hospital bill." Another, which seemed to be the most striking, ran: "Don't be a jay-walker—Cross the street at crossings."

Motion pictures showing how accidents occur were shown in all San Francisco's leading motion picture houses. Four-minute speakers appeared before the audiences and gave the Safety First message. These speakers also appeared before all the business clubs of the city at their regular meetings. The local ministers gave Safety First talks in the churches on the opening Sunday of the drive.

Several stunts were staged which brought the human interest appeal strongly into play. Boy Scouts were stationed at all the down-town corners on Saturday afternoon of both weeks and assisted the traffic officers in getting people safely across the streets. These manly little chaps, it was found, could hold back a crowd even better than the big, burly policemen of the San Francisco force. Their commands to halt and to proceed were received with smiles and grins and complete obedience by many who would usually be offended by the same command from an officer.

Another unique feature of the campaign was the outdoor court which was held on several days at the busiest street intersections. This court was in the form of a large rubber-neck auto, and during the rush hours, between twelve and one, special relays of policemen brought hundreds of jaywalkers into this court, where they were admonished by Judge Owens and allowed to go on their way. Every day that this court was in session Market Street was blocked by the curious crowds, and the Safety First message was forcefully driven home in a merry way.

Too much praise cannot be given to the loyal support which the San Francisco daily newspapers gave to the campaign. Because of the splendid understanding and cooperative support that exist between the Advertising Club and the press, column after column appeared every day, and many feature writers were detailed by the different newspapers to cover the campaign, both in its serious and in its comic aspects.


R.I.P.
If you like Flowers Buy Them
Don't Impose on Your Friends
San Francisco Safety First Campaign
Watch For Next Bulletin

A WARNING TO THOSE WHO TAKE CHANCES IN CROSSING CITY STREETS

The wonderful success of the San Francisco campaign should encourage other cities to spend the necessary time and money to put over similar movements. The fact that there was not one accident resulting in death or serious injury during the two weeks of the campaign established a record unequaled in the city's annals, according to a report from the office of the coroner.

The one big point which should be brought out as the reason for the success of this campaign is the fact that the campaign was treated from a very human standpoint. It was decided at the first meeting that there should be no attempt to bring the message home by gruesome or fearful methods, such as marking the spot where someone was killed a year ago or by the negative suggestion of telling people not to do certain things. Robert Roos, chairman of the committee, struck the keynote when he slangingly stated that the idea was to "kid the people into taking care of themselves."

Idaho State Highway Costs

The following statement illustrates why roads cost more to-day than they did a short time ago.

	Unit	1914	1920	Per Cent Increase
Excavation, earth..	cu. yds.	$ .20	$ .65	225
Excavation, loose rock	" "	.60	1.25	108
Excavation, solid rock	" "	1.75	5.00	185
Overhaul, per 100 feet	" "	.02	.05	150
Gravel surfacing, in place	" "	1.50	5.50	267
Concrcte	" "	10.00	35.00	250
Reinforcing steel, in place..........	lbs.	.05	.12	140

Average increase, 189 per cent.

The figures are taken from contracts awarded in 1914 and those awarded recently.

A few states have already shut down on all new construction until prices return to a normal basis, but most highway departments are continuing their programs. In one state where work was stopped this spring, the citizens have petitioned the Governor to have construction resumed at once, as they feel that the increased cost is amply justified by the benefits to the market roads.

A Comparative Study of State School Systems

MONTANA is credited with having a better public school system than any other state, according to the findings of a comparative study of state educational systems published by the Department of Education of the Russell Sage Foundation. Second place is assigned to the schools of California, third place to those of Arizona, fourth to New Jersey, and fifth to the state of Washington.

These findings are contained in a volume entitled "An Index Number for State School Systems," and the author is Dr. Leonard P. Ayres, Director of the Foundation's Department of Education.

Figures showing the educational standing of the different states each ten years since 1890 indicate that during this period the West has been coming up educationally while the East has been going down. The greatest relative improvement has been made by Utah, while the state that has shown the largest falling off during the period is Maryland. In general, the gains of the western states and the losses of the eastern ones have just counterbalanced each other. Among the states of the Atlantic seaboard the only one that has gained instead of losing is New Jersey. Among the forty-eight states the one which has had the best and most consistently high record is California. The figures indicate that up to 1900 Massachusetts held first place, giving way to the state of Washington in 1910, which in turn was superseded in first place by Montana in 1918.

EDUCATIONAL INDEX NUMBERS OF STATES IN 1918

1.	Montana	75.8	27.	Kansas	55.2
2.	California	71.2	28.	Canal Zone	55.1
3.	Arizona	66.2	29.	South Dakota	55.0
4.	New Jersey	65.9	30.	New Hampshire	54.4
5.	Dist. of Col.	64.3	31.	New Mexico	53.0
6.	Washington	63.7	32.	Vermont	51.5
7.	Iowa	61.9	33.	Wisconsin	51.3
8.	Utah	61.4	34.	Missouri	49.6
9.	Massachusetts	61.0	35.	Maine	47.4
10.	Michigan	60.1	36.	Oklahoma	44.4
11.	Connecticut	59.8	37.	Maryland	43.2
12.	Ohio	59.7	38.	Delaware	42.3
13.	New York	59.4	39.	Texas	41.1
14.	Colorado	59.2	40.	Florida	37.8
15.	North Dakota	59.1	41.	West Virginia	37.7
16.	Nevada	59.0	42.	Porto Rico	35.8
17.	Indiana	58.9	43.	Virginia	35.3
18.	Idaho	58.6	44.	Tennessee	35.1
19.	Minnesota	58.4	45.	Kentucky	35.0
20.	Oregon	57.8	46.	Louisiana	33.9
21.	Pennsylvania	57.7	47.	Georgia	32.6
22.	Nebraska	57.1	48.	North Carolina	30.6
23.	Hawaii	57.0	49.	Alabama	30.6
24.	Illinois	56.8	50.	Arkansas	30.3
25.	Wyoming	56.7	51.	Mississippi	30.0
26.	Rhode Island	56.3	52.	South Carolina	29.4

The Standing of the States

All the data are computed from figures furnished by the states themselves to the Federal Government. The standing of the forty-eight states, the District of Columbia, and the three territorial possessions is shown in the table on this page.

The Territorial Possessions

Not the least surprising of the results of the study is the fact that the educational system of our territorial possessions, such as Hawaii, the Canal Zone, and Porto Rico, have higher ratings than those of many of the forty-eight states. According to the tables of the report, the schools of Hawaii rank above those of the majority of American states, standing in their index number just above that of Illinois and just below that of Nebraska. The schools of the Canal Zone are in twenty-eighth place, just below those of Kansas and above those of South Dakota. The schools of Porto Rico are in forty-second place, above those of Virginia and below those of West Virginia. Ten southern states have records poorer than that of Porto Rico. This last showing is the more remarkable in view of the fact that the per capita wealth of Porto Rico is only about $200 per inhabitant. This is about one-fourth that of the poorest of American states, about one-twenty-fifth as much as that in the richest state, and about one-tenth as great as that of the average state. When it is taken into consideration that Porto Rico supports her schools from her own revenues, and that she has a large colored population, it is particularly noteworthy that she has a longer school year than any state in the Union and pays higher salaries than most of our southern states.

Losses and Gains Among the States

The degree to which the different states have lost or gained in relative rank since 1890 is shown by a table which reflects the tendency of the western states to move forward and the eastern states to fall back in maintenance of their educational systems:

State	Rank in 1890	Rank in 1918	Gain
Utah	27	7	20
North Dakota	33	14	19
Idaho	36	17	19
New Mexico	47	28	19
Washington	19	5	14
Iowa	17	6	11
Arizona	13	3	10
Oregon	29	19	10
Nebraska	30	21	9
Indiana	24	16	8
Montana	8	1	7
Minnesota	25	18	7
Michigan	15	9	6
South Dakota	31	26	5
New Jersey	7	4	3
Georgia	45	42	3
West Virginia	39	37	2
Ohio	12	11	1
Missouri	32	31	1
Tennessee	40	39	1
Louisiana	42	41	1
North Carolina	44	43	1
California	2	2	..
Texas	35	35	..
			Loss
Virginia	37	38	1
Alabama	43	44	1
South Carolina	46	47	1
Wyoming	21	23	2
Arkansas	41	45	4
Connecticut	5	10	5
Nevada	10	15	5
Kansas	20	25	5
Kentucky	34	40	6
Massachusetts	1	8	7
Colorado	6	13	7
Vermont	22	29	7
Illinois	14	22	8
Delaware	26	34	8
Florida	28	36	8
Mississippi	38	46	8
New York	3	12	9
New Hampshire	18	27	9
Maine	23	32	9
Pennsylvania	9	20	11
Wisconsin	16	30	14
Rhode Island	4	24	20
Maryland	11	33	22

Economic Statistics Applied to Education

The Foundation's report covers a piece of work which has been under way for many months. It applies to the problems of education, statistical methods that have long been in use in the fields of economics. The product of the investigation is an educational index number compiled by methods similar to those used by the Federal Government in compiling its index numbers for the cost of living, the prices of retail commodities, and the like. The Government's index numbers take into account changes in the prices of a large number of different elements and combine the results in a single number. By closely similar methods the new educational measurement is worked out by taking the official data showing the number of children attending school, the amount of training they secure, the progress they make, the amounts expended for buildings and supplies, the salaries paid their teachers, and other similar items, and combining these factors into a single index number which shows the general standing or efficiency of the school system.

The most notable educational change that has taken place during the 50 years covered by the report is in the attendance in high schools. There are now 100 times as many pupils enrolled in high schools as there were in 1870. The number then was 19,000, and now it is nearly 2,000,000.

The effect of the war is plainly seen in the high school figures for the past three years. The attendance has increased with great rapidity, but the new pupils have been mostly girls. Apparently the prosperity of the country has been such that families have sent their girls to high school while their brothers have gone to work and taken advantage of the high wages obtainable.

In the matter of teachers' salaries, the states show most diversified practices. The lowest average salary is $25 per month for the state of North Carolina, while the highest is $88 in California, both being based on a year of twelve months.

Health Inspection of Schools

With the lengthening of school terms and the increase in years of school demanded, there has come a decided advance in the work required of school children. When the standards were low, the work was not beyond the capacity of the weaker children, but with fuller classes and higher standards this has changed. The medical inspection of schools should be made obligatory, and the authority which has the right to compel attendance at school should have the added duty of seeing that no harm comes to those attending. Humanity requires that an opportunity of securing medical assistance be given children who may suffer through the ignorance or neglect of their parents.

A Report on the "Sick Man" of America —the Street Railway

The National Municipal League Committee on Public Utilities is of the Opinion that City Railways Are Too Important to Community Welfare to be Used for Financial Exploitation on the Old Scale

By Walter Jackson
Consultant on Electric Railway Fares and Motor Busses, Mt. Vernon, N. Y.

IN these fast-living times it is quite a long period since April, 1920, when the report of the National Municipal League Committee on Public Utilities was issued as a supplement to the *National Municipal Review* under the attractive title, "A Correct Policy Toward the Street Railway Problem." However, as the street railway patient has not yet tried the remedy offered by the committee, there is still opportunity to comment upon its possible efficacy if it is tried!

The committee says: "The policy of private management under public control has broken down," and if citations were needed to prove this, any edition of the *Electric Railway Journal* would do. Thus, the July 10, 1920, issue has news captions like these: "New Orleans Men May Strike," "Preparing for Toledo Vote" (on municipal construction and ownership of a competing street railway), "Long Fight in Rochester" (referring to service-at-cost), "Tacoma Fare Negotiations Fail," "Foreclosure Suit Started" (in Pittsburgh), "Security Values Shrink" (traction bonds worst of all), etc. Indeed, the financial difficulties of the electric railways are so great that they have led to the holding by many of the thoroughly mistaken idea that these difficulties in themselves prove that the electric railway is *passé* technically. That is far from the truth. A properly financed and properly operated electric railway can furnish more comfortable and reliable transportation at less cost than any other means yet devised. Chairman Delos F. Wilcox and his confréres, happily, have not fallen into the error of suggesting the simple, and silly, use of jitneys for street cars. Of course, the bus belongs, too, as the writer has stated recently in these columns,* but that's another story.

As the committee says: "The hope of speculative profits which induced private investors to put vast sums of money into it is now dead." To which we may add that this hope can never be revived because the great construction and *over-construction* era of the street railway has passed. Most new work is in the nature of extensions to existing lines, and even here the motor-bus offers a cheaper way of building budding traffic up to the point where it can be proved that the bigger capital cost of a trackway is justified. Capital for standard cars is readily obtained by car-trust certificates. The hundred-million-dollar rapid transit projects have been municipally backed from the start, and therefore do not enter into the question.

The financial handling of electric railways has therefore worked around to two contrary points of view among the electric railway men. The first is to *salvage* the existing investment by seeking the greatest amount of revenue from a diminishing number of unwilling customers, clinging desperately to the monopoly and perpetuity features of the contract, but insisting that the city's *quid pro quo* of a 5-cent fare is obsolescent. The second point of view is that the situation may be saved by following the doctrine of getting maximum revenue from a maximum number of willing customers, trusting to the fairness of the general public to see that the company's desire to serve is met by permission to make increases in fare (or throw over the unit fare altogether), accompanied by fullest possible freedom to use its experience in choice of equipment, routing, character of service, and other purely technical matters. The future of private ownership of electric railways lies far more with this type of management than it does with capital which is ever gravitating toward the highest return with the smallest interference.

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* The American City, July, 1920, page 49.

"Capital is getting 'ugly,' and the public, in its alarm, is withdrawing the hand of regulation," continues the committee. However much the hand of regulation or legislation be withdrawn, and no matter what drastic means are used to suppress the jitney, the result will not be satisfactory in the long run, because the private automobile and the motor truck are present in ever-growing numbers to deprive unpopular electric railways of the margin of profit that spells existence. Observe in such towns the scores of motor trucks, each carrying a dozen or more workmen to and from the plant; or the inroads made by Fordians or Fordites who pick up their neighbors going to and from the office district. No, the way of "gang your own gait" won't do for an industry that has competition which can be minimized to harmless proportions only by frequent service, good service and logical fares.

Under the heading, "The Lack of a Definite Public Policy," the committee points out some of the difficulties that have arisen through the fact that so many electric railways extend beyond individual municipal boundaries and because of the clashes that arise between the state and the local regulatory authorities. The writer believes that this situation can be met largely by a form of coöperation similar to that of the *Zweck-Verband Gross Berlin* whereby Berlin and its satellite communities have agreed to act as a unit in all matters relating to transportation development and control, parks and other public lands, etc. A single public service corporation covering half a state has an overwhelming advantage in negotiating with one hundred or more communities of different size, character and needs. It simply follows the rule "Divide and conquer."

Monopoly Essential in a Public Utility

Quoting the 1915 program of the League, the committee repeats that "Each utility serving an urban community should be treated as far as practicable as a monopoly with the obligations of a monopoly." Going back to the 1911 conference, it adds later that "The aim should be to make street railway securities approximately as safe as municipal bonds." When we put these two statements side by side, we see that if a corporation enjoys both monopoly and assured return, its owners would have no complaint to make if they were *investors* and not speculators. Make the street railway return as safe as a municipal bond. and you will have little trouble in raising the relatively modest amounts needed now in comparison with the building boom of the industry.

The next point, of course, is to find a basis of capitalization upon which such an assured return could be made. Here is where we run into the wilderness of valuation with its gamut of theories, from "actual investment," as advocated by the buying side (the municipality), to "reproduction cost new," as advocated by the selling side (the company). We fear that every community will have to settle that argument in its own way. It is the fashion of the service-at-cost advocates to look to Cleveland and its measurable success, but let it not be forgotten that the Cleveland plan was preceded by years of bitter controversy and by a drastic cut in capitalization.

There is, of course, the question of the ultimate public ownership of all street railways by their communities, but as the policy of the National Municipal League in this respect is well known, it is unnecessary to discuss it here in view of the pressing immediate problems of the electric railway industry as it is.

Street Railway Transportation a Public Function

But to conclude with the report. None of us can quarrel with the committee's conclusion that the street railway cannot be put upon a *permanently* sound basis by means of higher fares, subsidies nor changes in operating methods—considered separately or together. This is essentially a community problem. What may be best for the capital in the private corporation may not be best for the people in the public corporation. If private management is to remain, it can do so only upon condition that it shall become increasingly instead of decreasingly useful to the community, with the proviso that its reward shall be in proportion to such usefulness. There is more than one good man in the industry to-day willing to serve on that basis.

Forward Steps
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

Park Departments

The People of Schenectady Make Good Use of Parks and Pavements

SCHENECTADY, N. Y.—Many cities have wished that their parks might be free from "Keep Off the Grass" signs. In the parks of Schenectady there are no signs, except to direct traffic. The services of policemen are not required to keep the crowds in order; the crowds take care of themselves. This condition is due to the schooling of the public in the fact that they, the people, own the parks, and that their money has built and maintains the entire system. The civic lesson has been well learned.

If the people prefer to sit or walk on the grass they are never stopped. Grass can be grown cheaper than good will can be developed. Appreciating the fact of ownership, the people do not steal or destroy the flowers nor injure the trees. Vandalism is unknown. Papers are not strewn on the lawns nor thrown indiscriminately about the parks, but are placed in the receptacles provided. Picnic parties throw their refuse in the cans located in the picnic groves. The people are given the liberty of the parks, and they know how to combine that liberty with order.

Schenectady is said to be the first city in America to introduce community singing and dancing on the pavement as a municipal project, carried on by the Park Bureau. In the congested sections of the city this has proved to be a most popular and successful form of entertainment. Entire neighborhoods turn out to enjoy the affairs. Neighbors meet one another on the same status and become better acquainted. Through the medium of these dances friendly relations are established between people who in no other manner would have become acquainted. Last year the popularity of the dances grew as the season advanced, and at the end many regrets were expressed that this form of entertainment had to be discontinued. More real Americanization work was accomplished in the foreign districts by this social and community entertainment than by any other means.

DANIEL J. SWEENEY,
Superintendent of Parks.

Public Welfare Departments

Patching Up the Rents

BOSTON, MASS.—In approaching the housing problem in Boston, Mayor Peters appointed a Rent and Housing Committee, which was organized on March 26 to adjust difficulties between landlords and tenants, and to make a study of housing needs. The Committee, in its endeavors to equitably adjust differences between landlords and tenants, has obtained results in 1,125 cases. These results have been tabulated as follows:

Rent increases adjusted	241
Rent increases found to be not unreasonable	130
Tenant and owner to adjust	170
Extension obtained on vacate notices	209
Extension impossible to obtain on vacate notices	37
No rent increase until repairs are made	9
Information asked by tenants for future action	75
Complaints investigated and held at request of tenant	52
Referred to Board of Health	35
Referred to Fire Department	6
Referred to Police Department	2
Referred to Water Department	1
Referred to Legal Aid Society	4
Referred to other cities	25
Adjusted at State House	6
Pending in court	21
Disposed of by tenant	11
Vacate notices found to be illegal	42
Miscellaneous	49
	1,125

In cases where legal notice to vacate has been served, the Committee has been successful in obtaining extensions beyond the time specified in 85 per cent of such cases. In complaints of rent increases it has made adjustments in 45 per cent of such complaints; it has found rent increases to be not unreasonable in 24 per cent; and it has effected agreements between landlords and tenants themselves to adjust amicably in 31 per cent. In other words, adjustments were made directly or indirectly in 76 per cent of the complaints of rent increases presented to it.

One of the first things this Committee did was to secure from the assessors a list of all vacant houses in the city. Thereafter, a questionnaire was sent to the owners as to the condition and rental value of these properties, and, as a result of the distribution of this questionnaire, the Committee has on file considerable information about the properties for all persons who are seeking places in which to live.

EDWARD F. CONDON,
Secretary, Rent and Housing Committee.

Recreation Departments

Children's Shower Baths in Quantity

Buffalo, N. Y.—Since the beginning of the big city as we know it to-day, the poor, congested district has always been a pitiable sight on a hot day, particularly its sweltering children. To meet that condition, Albert C. Febrey, Director of the Bureau of Recreation for Buffalo, has designed a gigantic shower bath for the comfort of the children.

During each warm day this summer the city will close one block of street to traffic for two hours and give children for blocks around a chance to get under this shower, which will throw a spray 150 feet long and wide enough to easily accommodate 200 to 300 bathing-suit-clad youngsters. The nozzle spray device is designed to be attached to the ordinary street hydrant and throw the spray lengthwise along the street. Buffalo is credited with being the first city to try this scheme for the children that cannot go to the beaches or parks.

JOHN H. MALONE,
Commissioner of Parks and Public Buildings.

City Clerks

Manitowoc's Bonds Taken Locally by Direct Sale

Manitowoc, Wis.—The city of Manitowoc recently issued $200,000 bridge bonds, bearing 5 per cent interest. Having been unable to interest private concerns in underwriting these bonds at a satisfactory figure, the City Council decided to offer them to the public at large, at par and accrued interest, the City Clerk to have charge of the selling. These bonds were oversubscribed for in less than two weeks by the local public. No advertising campaign was necessary, except a notice published in the local papers that these bonds were for sale at the City Clerk's office.

The two advantages of this plan of financing are apparent: interest in public expenditures is increased by having the bonds held locally; and the municipality secured its money economically.

ARTHUR H. ZANDER,
City Clerk.

Highway Departments

Publicity for Street Cleaning Department

Erie, Pa.—There is no part of the city administration that is more important than the street cleaning department. But so little publicity has been given to street cleaning in Erie that few citizens gave it much consideration, or had any thought of the city department having supervision of the work. To advertise the department, and call attention to its work, the Superintendent organized a baseball team, recruited largely from the department, and called by the name of the "Street Cleaners." It has made a good record in and out of town, one of its principal rivals being the team representing the Fire Department. The result is all that was hoped. People talk about the team, and every time they mention the "Street Cleaners" it connects up

GOOD ADVERTISING FOR THE STREET CLEANING DEPARTMENT OF ERIE, PA.

their minds with a municipal subject to which they ought to give some of their attention.

The success of the baseball team will probably lead to having a Street Cleaners team in the city basketball league next winter.

THEODORE EICHHORN,
Superintendent, Department of Streets and Public Improvements.

Finance Departments

A Municipal Bank

St. Paul, Minn.—The Sinking Fund Investment Committee of this city, consisting of the Mayor, the Comptroller and the Commissioner of Finance, are authorized by the city charter to buy and sell the securities of the city of St. Paul in fractional parts. The method of carrying this on is to issue certificates to the depositor in multiples of $10. Money received from the depositors is invested in securities of the city of St. Paul of various kinds. These certificates are sold over the counter every business day from nine to five o'clock and bear interest at the rate of 4 per cent. The certificates are payable on demand with interest to the date of withdrawal. The plan has been in operation about five years and a half, and we have now on deposit about $3,800,000.

The Committee buys securities of the city in the open market or bids for bonds that are offered for sale by the city against other investors. We have a few short-time certificates for local improvements, which the Committee takes over directly from the city. When this was inaugurated in 1913, the city issued three classes of securities: first, regular bonds sold on the market at market rate; second, tax levy certificates issued in anticipation of the collection of taxes for the year—one-year certificates usually bearing interest at the rate of 4 per cent; and, third, special assessment bonds secured by assessments made upon benefited property for local improvements, these bearing interest from 5½ to 6 per cent and running three years.

We found it difficult to sell on the 4½ per cent basis the bonds which had to be sold at par with accrued interest. The first issue taken over under this system was

$150,000 worth of water bonds. This system of the sale of certificates was opposed by many of the trust and savings banks of the city, which claimed it interfered with their business. It did to a certain extent, because many of them were paying 3½ per cent on deposits remaining six months or more in the bank. The city could afford to pay 4 per cent and have these certificates redeemable any time with interest to the date of withdrawal.

In 1916 the institution went through a run during the month of April, paying out nearly a million dollars. When the run was broken, the Committee held all its highest rate securities intact, having disposed of all the lower rate maturities to meet the run. Following the passage of a city charter amendment money began to flow back into the fund and has continued ever since. We found that we had afforded a safe depository for the peoples' money, had placed the finances of the city on a much sounder basis, and could protect the city against extortion by bond buyers. It also enabled us to have a fund on which we could draw for emergencies to finance some special improvement.

It is believed that this is the only city that has this system, although it is a system that with slight variations could be put into operation in any city where the raising of money by bond issue was important. The net income of this fund, after paying all expenses of operation for the ten months of 1918, up to November 1, was $10,506.21. The net income for the month of October was $1,254.22. The money raised by the bank is deposited with the First National Bank of this city every day. The business is handled by two clerks.

Recently the bank has been a help in negotiating the sale of other securities on a 4½ per cent basis. Our last sale was October 8, and the City Bank bid in $100,000 worth of water bonds on a 4½ per cent basis, not having received bids at par from outside parties. The fund grows at the rate of $100,000 a month, which has permitted us to handle all the bond sales that the city has made in the last two years. Under this system we can take up the bonds at any time and furnish from $100,000 to $400,000 in money on very short notice.

The writer has personally managed this affair ever since its inception in 1913, and, knowing the ins and outs of the whole business, the vicissitudes through which we have passed and the successful backing by the people, is enthusiastically in favor of this proposition. He is preparing a history of this experiment in financing, which it is hoped will soon be ready for general circulation. The experiment has been so successful that it seems worthy of consideration in almost any city.

S. A. FARNSWORTH,
Commissioner of Finance.

Departments of Education

Thrift Lessons in St. Louis Schools

St. Louis, Mo.—That the collection and sale of waste paper in the St. Louis public schools is rapidly assuming the aspects of "big business" is indicated in a report just made by Stephen M. Wagner, member of the Board of Education.

This movement had its inception in a resolution introduced by Mr. Wagner at a Board meeting in April, 1916, its purpose as outlined at that time being to have the pupils in the schools bring old papers, books and magazines to school to be turned over to firms dealing in waste paper. The proceeds of all sales were to go to the credit of the Teachers Benevolent Annuity Association, a voluntary organization of St. Louis teachers formed for the purpose of paying annuities to those of its members who retire after long service and for giving relief to members temporarily in need.

Over 100,000 pupils in 135 schools now participate in this work. Old newspapers and magazines are saved, and once each week are brought to school, where they are deposited in proper receptacles, later to be gathered up by an automobile truck and carried away. To stimulate interest on the part of pupils, some schools have instituted contests with one room pitted against another. Other contests have been brought into play at various times, all tending to arouse interest on the part of pupils. In some schools the room having the largest collection of paper is awarded a banner, to be retained until some other room makes a better record. That the schools are not only doing very important work in raising money for a worthy cause, but that they are also of material assistance in helping to conserve the constantly lessening supply of white paper, is indicated by some of the figures submitted.

From the time the schools opened in September, 1919, to the time they closed in June, 1920, the pupils collected a total of 858 tons of paper. Of this amount, 764 tons consisted of newspapers, and 94 tons of magazines. Had it not been for the prevalence of influenza during several months, the total for 1920 would have been much greater.

Since the start of the paper-saving movement, a grand total of $37,813.34 has been realized from its sale. The total receipts realized from the sale of waste paper for the school year ending June 30, 1920, was $20,675, and the expense of operation was $3,367, making a net profit of $17,208. Prices in effect at the present time are as follows: $1.25 per 100 pounds for newspapers, and $2.75 for magazines. An auto truck has been purchased by the Teachers Association in order to facilitate collections of paper and delivery to the firms buying waste paper.

Saving paper has become a regular part of a well-planned system of education for thrift in the St. Louis public schools. The Thrift Stamp Campaign, started in December, 1916, was the beginning of a course of learning to save. A regular school banking system has been inaugurated in most of the schools, and is finding its way into all. The boys and girls in the St. Louis schools bring their pennies, nickles, dimes and quarters, or any amount of money they can save, deposit it with a cashier selected by them, and are credited in their bank books with what they save.

That the children of St. Louis have acquired the habit of saving is shown by the large amounts of money saved which are reported to the Assistant Superintendent in charge every Saturday. Since the Thrift Stamp Campaign was inaugurated, $504,915.81—more than half a million dollars' worth—have been purchased through the schools.

C. G. RATHMAN,
Assistant Superintendent of Instruction.

When the School Children Spoke for Themselves

LOS ANGELES, CALIF.—Like other cities, Los Angeles' school building program was

"SHE HAD SO MANY CHILDREN SHE DIDN'T KNOW WHAT TO DO"
A float in the school-building bond parade in Los Angeles

interrupted by the war, and several score new buildings were needed to make the school population comfortable. Since September, 1919, the children of school age have been increasing at a rate of more than 1,000 a month. To enlist popular sentiment in the voting of $9,500,000 in bonds for the necessary building, the school children took part in a great parade. On the day before the election, more than 100 of the larger schools participated in the pageant, requiring more than two hours to pass a given point. Each school was allowed to use its own judgment in the character of its entry, and as a result no pickle manufacturer on earth had anything "on" this parade, so far as variety was concerned. The effectiveness of the campaign of the children was proved by the vote for the bonds, which carried by 14 to 1.

Gettysburg's Playground Investment

By Paul Reid Pontius

President, Playground Association, Gettysburg, Pa.

IN the months following the armistice, the people of Gettysburg, like those of many other American cities, noted a discouraging increase in juvenile delinquency and general unrest among the young people of the town. Gambling was rife, and a series of sensational hold-ups aroused the community to the need of corrective action. Gettysburg turned to the same remedy which other cities have tried and found helpful—increased facilities for out-of-door recreation.

The city already had at its disposal a playground, or park, of some 17½ acres, equipped with a caretaker's lodge, on the first floor of which are showers and lockers for boys and men, and a retiring room for girls and women. This playground was the gift of William B. Kurtz, a Philadelphia banker, whose boyhood had been spent in Gettysburg. The community realized that it was not getting the full use of this gift and determined to organize its play. A Playground Association was formed, and a trained playground director engaged. Recognizing local enthusiasm for baseball, the Association organized a league by city wards, repaired the diamond, and built a grand stand and bleachers. The league was a great success, and the playground attained such a degree of popularity that its facilities were severely taxed. Accordingly, this year, an additional director of play has been employed. Five tennis courts have been laid out, as well as a football field, and many minor improvements have been added. The local band has been engaged to give weekly concerts during the summer months.

As the city makes no appropriation for this recreation work, the funds have so far been secured by "drives" among the citizens. Last year $4,250.44 was spent, and it is expected that at least an equal sum will be required for the work of this summer. But Gettysburg is satisfied with its investment.

GIANT STRIDE IN A GETTYSBURG PLAYGROUND

A PENETRATION ROAD BUILT WITH REFINED TAR BY THE OTTAWA IMPROVEMENT COMMISSION IN 1913

Bituminous Penetration Surfaces for Highways

By A. B. Manson

Chief Engineer, Stratford, Ontario

BITUMINOUS penetration surfaces are readily divided into two classes or groups, the one superficial and the other more nearly permanent. Under the superficial class come all surface treatments, such as dust palliatives, while the more nearly permanent class are bituminous bonded roads and pavements.

The Use of Road Oils

One of the most disastrous happenings to a road is the loss of the dust or binder in it, and one of the most disagreeable conditions to the traveling public is the dust nuisance. If it is possible to remove one evil, both are removed. Up to date possibly the most efficient means to this end is the use of road oils. Road oils are indeed a blessing, though sometimes rather expensive. The purchasing official should first of all make sure that he knows what he is buying, and then that he applies the proper quality to the proper type of road. Not every quality of oil is either economical or useful to every type of road.

For satisfactory practice the road should be in good condition as to crown, grade, etc., and cleaned as free from dust as possible. The road should be warm and dry, and the oil should be applied with the better class of mechanical distributors evenly and in such quantity that the road will readily absorb it. To secure the best results the oil should then be covered lightly with sharp sand or clean stone chips. In time and after a number of applications, if the road is not knocked to pieces with too heavy traffic, a covering of this bitumen and stone will be formed that is impervious to water and satisfactory in the prevention of dust.

The economic development of any country demands road improvement. Traffic demands the development of roads. Every country passes from the original clay road to the finished pavement. Both Canada and the United States have now reached the state of development where the rural as well as the urban roads require more than the lesser types of permanency, particularly on main highways. Still it must be realized that many portions have not advanced far enough to finance the expensive pavements. The bituminous penetration pavement is one of the types that bridges the two extremes. forms is doubtless the chief visible propa- forms is doubtless the chief visible propagandist of improved roads, backed by the real demand for improvement as an economic necessity. The idea of the bituminous penetration road is to get something of a more nearly permanent nature, something with a bond more enduring than water and stone dust, something that will prevent the very life of the road from being thrown over the neighbor's fence every time a motor car passes, without the bankrupting cost of the expensive pavement.

Qualities of Bituminous Penetration Roads

Several reasons might be advanced for the use of the bituminous penetration road. It is an old and tried method and for its purpose has stood the test. In old London one hundred years ago builders constructed bituminous pavements by the penetration method. Since then hundreds of miles have been added, and this process is still used for construction and maintenance.

Its simplicity of construction lends itself admirably to road building distant from cities and centers of population. No extensive plant and equipment is necessary. Skilled labor is not absolutely necessary, though skilled supervision is a necessity here as everywhere. Thoroughfares need not be kept closed for long periods, as in some types of construction.

The great problem is, how can we construct and permanently maintain on our country highways a serviceable pavement surface at a cost that will not mean bankruptcy to the community or confiscation of the abutting property by special assessments?

While seeking an answer, we must not lose sight of the fact that every pavement has its faults and that no one is the panacea of all road ills. We must treat every road or part of a road as a separate individual proposition, and spend our money in the purchase of a pavement just as we would in any other good purchase—the best value for the least money.

Among the requirements to be considered in choosing this wearing surface are: it should be smooth, easily cleaned, not dusty, noisy or slippery, easy to construct, easy to repair, attractive in appearance, and, above all, suited to the traffic to which it will be subjected.

Details of the Work

Returning now to a closer consideration of these items, a word about the construction other than the surface might be in order, as it is always the prime prerequisite of every pavement—the preliminary or foundation work. As often said, and yet not always heeded, every road needs drainage—the more nearly perfect the better. Be sure your side drains are good and lead somewhere. Too often a bad outlet wrecks the whole system. Give particular attention to the hillsides and the places where poor or indifferent material exists for foundation, and once the foundation material is in place, consolidate as perfectly as may be by rolling, until there is no movement of the base.

Before placing the first course of stone, all excess dirt and fine material should be swept from the surface of the foundation. This promotes a closer bond between the pavement and the foundation and tends also to prevent the stone from being dust coated and thus interfering with the proper adhesion of the bitumen to the surface of the individual fragments. If tar is used as the cementing element in the road, a covering or coat of tar is applied to the base thus cleaned. This tar penetrates to a degree and also forms a close binder between the base and the surface.

If asphalt is used as the binder, this first or paint coat is not employed. As the completed thickness of the pavement is usually 2 to 3 inches, the broken stone should all pass a 2-inch ring. It should consist of sound, tough and angular fragments of uniform quality, free from dirt and other objectionable matter either occurring loose or adhering to the stone. If it is stored in piles along the roadside prior to use, particular precautions should be taken to prevent its becoming mixed with dirt. The stone should be as nearly of uniform size as possible, so as to produce a course of uniform texture which when rolled will have the voids evenly distributed. Wide variation in sizes, particularly running to small sizes, results in the formation of spots which become so dense that uniform penetration will be very much hindered or prevented altogether. Such places may not be readily discernible in the newly finished pavement, but will ravel and disintegrate under traffic long before the pavement has attained its normal life. For this reason special care should be taken in the choice of stone, and to secure the desired stone is no small difficulty.

The stone should also be sufficiently durable to prevent the excessive formation of dust during the first rolling and before the application of the bitumen. Further, for securing the best results the broken stone should be shoveled and not dumped in place on the foundation. The common practice of dumping loads where the stone is required and spreading out the piles results in the segregation of the fine material, which hinders penetration and makes uniformity of surface almost impossible. This is due to the fact that the center of the space originally occupied by each load receives upon dumping a compacting effect much greater than the surrounding area, and on rolling leaves such places slightly higher. An uneven road will be the natural result. The best practice, which is seldom followed, calls for dumping the stone on dumping boards, from which it is spread by shoveling.

After the stone has been uniformly spread to a depth of 3 inches loose, it is rolled dry until the fragments are well set. A 12-ton, 3-wheel roller is usually satisfactory and is operated as in ordinary water-bound macadam construction. The rolling should be carefully watched, and discontinued when the stone is thoroughly keyed together and before dust begins to accumulate on the surface or the stone is crushed. If the stone is crushed, the voids are filled and penetration is prevented. The tendency, however, is to under-roll rather than over-roll, and in either case an inferior pavement results. If irregularities appear on the rolled surface, the spots should be dug out or otherwise brought to the required level.

The Use of Binder Distributors

Possibly the most satisfactory, at least excellent, results are obtained from the use of mechanical distributors for applying the bituminous binder, provided that they are of good design and properly operated. Most of the modern distributors are of heavy construction and apply the heated bitumen either by a single nozzle operated at the rear or by a set of nozzles set in a row close to the road. The single nozzle requires considerable skill on behalf of the operator, but on the other hand has a wider scope. As the distributor passes over the compacted stone, it is very important that rutting does not occur. It is essential, therefore, that sufficiently wide tires be used on the machine. The American Society for Municipal Improvements gives a specification for such a mechanical distributor which covers important features; it is, in part, as follows:

> "The pressure distributor employed shall be so designed and operated as to distribute the bituminous materials specified uniformly under a pressure of not less than 20 pounds nor more than 75 pounds per square inch in the amount and between the limits of temperature specified. It shall be supplied with an accurate stationary thermometer in the tank containing the bituminous material and with

A HEAVY-DUTY MOTOR PRESSURE DISTRIBUTOR APPLYING HOT BITUMINOUS MATERIAL IN BUILDING A PENETRATION ROAD an accurate pressure gauge so located as to be easily observed by the engineer while walking beside the distributor. It shall be so operated that at the termination of each run the bituminous material will be shut off at once.

"It shall be so designed that the normal width of application shall be not less than 6 feet, and so that it will be possible on either side of the machine to apply widths of not more than 2 feet. The distributor shall be provided with wheels having tires, each of which shall be not less than 18 inches in width, the allowed maximum pressure per square inch of tire being dependent upon the following relationship between the aforesaid pressure and diameter of the wheel: for a 2-foot diameter wheel, 250 pounds shall be the maximum pressure per linear inch of width of tire per wheel, an additional pressure of 20 pounds per inch being allowed for each additional 3 inches in diameter."

In operating a mechanical distributor it is important that application should not overlap either at the ends or sides, and that at the completion the nozzles should not drip on the road. Care should be taken that the nozzles are kept clean so that no strips are left to be later closed in by the hand pouring pot. By calculation and experience the proper amount of bitumen may be delivered on the road with reasonable precision. Adjustments as to speed of travel and in feed to the nozzle may be readily arrived at by an experienced operator.

Immediately after this first application of bitumen a uniform layer of small-size broken stone should be spread over the surface in such quantity as to fill the surface voids. The road should then be rolled, with the addition of more stone if necessary. The size of this stone is about ¾-inch. It should also be clean and free from dust and dry, so that the bond with the road will not be interfered with and will present a proper surface for the reception of the final or seal coat. The bitumen surface should also be kept free from dust, dirt or foreign substances while this ¾-inch stone is being spread. Good practice is to deliver the stone by a side swing of the shovel, which spreads the stone evenly and gives more opportunity for the stone to come to rest in the voids. Just sufficient of this course should be used, otherwise the roller will crush the excess and form a blanket or mat with little wearing ability and preventing the penetration of bitumen. The surface is then swept to remove excess of stone and fine material not held firmly in place.

The seal coat is then applied in exactly the same manner as the previous application, except that the quantity is less, there being much less penetration. The surface is uniformly coated, care being taken to avoid excess which would form a thick, undesirable mat.

Immediately after the bitumen is applied it should be covered with a thin layer of small broken stone of good, clean, hard quality or clean, sharp sand. The amount placed should be just enough to fill any remaining voids and act as a thin covering over the bitumen to prevent its sticking to the wheels of traffic. Rolling them finally compacts the road and forces the particles of sand or stone together, leaving a finished, smooth surface.

The rolling of the pavement after it is completed is a matter which appears to be slighted frequently. The rolling of a penetration road is a vastly different proposition from the rolling of sheet asphalt or of bituminous concrete having a well graded mineral content. It should be rolled when sufficiently warm, so that the road is somewhat plastic. This rolling should be carried on for some time after the pavement is opened to traffic, possibly for two weeks. Too much stress cannot be laid on the rolling or compacting of the road and the reduction of voids to a minimum.

It goes without saying that all this work should be done in the heat of summer, but in practice this is very often not the case, and frequently contracts run into late fall, which of course gives rise to many difficulties. The stone is cold and chills the bitumen, causing improper penetration. It is more apt to be damp, preventing proper adhesion. After the first frosts, leaves from trees along the roadside, more particularly in city streets, fall on the loose stone, and if not removed prevent penetration.

The final dressing of small stone or sand above referred to should be left on, and if necessary kept on and swept about for the first year. This very materially assists in filling the surface voids, which is most essential and vital to the life of the pavement. Traffic will iron a dressing of sand, if properly spread, to a very smooth surface, and we then have one of the factors of good paving—smoothness. Being smooth, it readily lends itself to ease in cleaning, which in turn prevents dust.

Maintenance Requirements

Following the capital cost of any pavement, the most important consideration is the question of maintenance. Ordinarily a properly designed and constructed penetration road should require small repairs. A rejuvenation of the seal coat or its renewal when worn away should be the limit unless traffic is exceedingly heavy or the dirt hauled on the road has been ground into the surface before cleaning. No attention should be required for from three to five years, and then a light dressing of road oil covered with stone chips or sharp sand will replace or renew the life of the seal coat. Care should be taken that too thick a mat is not formed, which would have quite a tendency to shove under traffic and form waves.

As the seal coat forms the roof of the road, it should never be allowed to wear out. It forms a water-proof blanket, preventing water from penetrating and spelling destruction. If proper adhesion to the road is secured and traffic is uniformly distributed, the seal coat will wear away very slowly and evenly. When it is worn, a coat or dressing should be applied in a manner exactly similar to the application of the original seal coat.

If, on the other hand, breaks occur anywhere in the seal coat, they should be promptly repaired. Broom and clean out the weak spots to allow proper adhesion, then apply the bitumen and stone chips, and tamp back to a level with the original road.

By maintaining the seal coat, the life of the road is continued indefinitely. Frequently a break in the surface is due to lack of support from below. The cause of this may be weak foundation, poor subgrade or faulty drainage. Under such circumstances it is obvious that the proper procedure is to remove the cause of failure before attempting a repair on the surface. Further causes of failure may be unsound stone and improper distribution, as well as the use of bitumen damaged or unsuitable for the purpose. The appearance of ruts may be the result of improper rolling, or the rutting of the stone while the bitumen is being applied, or the use of too much or too soft binder.

BRANT ROAD, GALT, ONTARIO, A GOOD EXAMPLE OF THE PENETRATION METHOD, USING THREE APPLICATIONS OF REFINED BITUMINOUS BINDER

Acknowledgment.—From a paper read at the Sixth Annual Conference on Road Construction, Toronto, Ontario, Canada.

Publicity and Public Health Education

By Edward Warfel

Director, Division of Publicity, Indiana Board of Health

NOTWITHSTANDING the antipathy often voiced among publishers and editors, the press agent still survives. For with all his faults the press agent serves a purpose. Who will deny that he makes people think? True, the reaction is not always to the lasting benefit of the thinker. But he thinks, nevertheless. And it is sometimes a kind of thought that calls for action, and this is the germ of progress.

The Appeal to Public Opinion

The food control law, the greatest piece of arbitrary highhandedness ever perpetrated upon our people, and the most radical regulation ever conceived in a democracy, was made possible because of what? Because of the efforts of a new type of press agent, nothing more, nothing less. There was created a greater force than any law. It was the force of public opinion. The idea of food was cleverly linked up by the federal agent with the idea of winning the war, and truthfully it was declared that food was essential to victory.

Again we had a demonstration of the power of the press agent. When the coal supply seemed inadequate, when production was not keeping up with demand or consumption, along came a presidential appointee and stopped practically all business east of the Mississippi, except that directly connected with the manufacture of munitions, on one additional day per week following the Sabbath, until conditions were more nearly normal. There was no law for it; to many there seemed no excuse for it. But Administrator Garfield's so-called educational division had declared it was essential. The American people took the newspapers' printed word for gospel, and thousands threw into the war hopper an extra day of idleness which indirectly contributed what one division of the war administration said was required to win the victory. It was without precedent the heatless Monday, and it required an audacity second only to the vision that directed it.

Thus we provided food and fuel in wholly adequate supply. Both were needed and both essential. But neither of itself could be expected to play more than a limited part in winning the conflict. Which brings us to the thing that actually did win the war—the sturdy manhood of our young men who carried the burden of battle to the front line trenches with such vigor, such determination, such stamina that even the scientifically trained and highly developed brutes of the Hohenzollerns fled in startled dismay. But where did we get this manhood? How was it mustered? We had to take those who were fit in making up our army, and the rest—what of them?

I believe that had the Surgeon General of the army been as radical as some other enterprising Washington functionaries in his enthusiasm for success, for results such as all America hoped and prayed for, he would have patterned after their example and indulged in the publicity game, for a greater, more beneficent and far-reaching purpose. He might not have improved the quality of the material submitted to the draft boards, but he could have thrown a bomb of truth into the ranks of the people which might have seriously interfered with their aplomb.

But the truth could not be concealed when man after man, supposedly the flower of our manhood, turned out to be weeds in our Eden. And when the total of rejections became so large as to be startling, questions were asked. And now the truth is coming out. Slowly the work is trickling back into the homes. The reasons are being given for the incapacity of many of our "best" young men failing to come up to the minimum requirements of a man's man. I say the word is coming slowly. It is in many places coming so slowly as to be practically imperceptible and ineffective. Why is this? Is there something sacred about a fact that conveys to a weakling the cause of his weakness? Is it the peculiar province of the physician to know the things that are contributing to the decline of a race and lock this knowledge in his bosom? No!

If the great masses of the people, just plain people, have won anything by the bloody struggles of the last four years, it is a right to be on the inside. We have all declared against secret treaties. We want diplomacy in the open. We want and insist that reasons be given for any and all actions that have either a national or an international significance. We want "open covenants, openly arrived at." Then why should we not have light on the subject of our own fitness to survive and to fight for the things that make life worth while? Can there be any denial of such privilege? What, then, is the answer?

An Appeal to Health Officers

It rests with you—you who know—to tell the public freely and frankly what constitutes the trouble. You know why hundreds of thousands of our "best" young people are headed for an early grave, an insane asylum or a hospital, and yet you hesitate to state openly that it is because of venereal diseases. You know why hundreds of thousands die annually from tuberculosis, and you know how this awful thing can be prevented. You know where typhoid originates, and you know that it is a nasty thing to talk about. For weeks I have been referring to the "prudery" of people which seeks to hide the truth about venereal disease. But what is this compared to the cloak of inscrutable silence that too often characterizes your official position and your professional life?

I am not suggesting that you disclose professional secrets. I am not intimating that a possibility exists whereby any public good could come of a betrayal of confidence that comes to you in your practice. But I am insisting that you have no right to distinguish between your duties as physicians and your duties as teachers.

I venture the opinion that there were many omissions that cost the American people more than it is possible to represent in figures of dollars and cents, more than any failure of aircraft or big guns, and I am wondering whether one of these omissions was that the Surgeon General of the Army operated without the publicity and educational facilities which might have contributed facts of priceless value to the American people, whose attention he had then as he never had before, and as he may never have it again. This is simply on the theory that the time to do business is while you have a prospective customer's attention.

There are many, including some whom I regard as eminent authority, who insistently assert that our entire success in connection with the winning of the war was due to the intensive salesmanship of a big idea. The idea was that through highly crystallized public sentiment it would be possible to carry out any program held necessary to win. The conscription scheme was a success because it was backed by the popular conviction that it was right, that it was necessary, and that it hit every fellow alike. Food control and fuel control, with their arbitrary, sometimes unreasonable, and often misconceived regulations, were effective in exactly the same way.

It seems to me that health officers have before them the opportunity for the most beneficent and lasting public service that has survived the war. The necessity for recruiting a large body of fighting men has passed; there is no longer an emergency to warrant government control either of food or fuel. But there is a continuing and an increasing need of the manhood and womanhood fit to survive and solve the complex problems of the new day. These problems are of a magnitude never equalled in the world's history, and they call for brains and brawn of men and women in full possession of all their faculties and with all their faculties keyed to the highest efficiency. This force is available only to a generation that is trained to healthful practices, to high ideals and right living. You are therefore the missionaries of the new civilization, the apostles of the new freedom, the exponents of the new religion.

And the mechanical agencies for public education, the public press, the theater, the platform and the pulpit, are open to you as never before. This old world has been aroused from its stupor. It has been shaken from the sleep of ages that had produced a flabbiness of flesh and soul, and it is preparing for a man's work. Society, at least in large part, has learned its lesson. It is open to leadership. It desires direction. The value attached to human life and human happiness has been emphasized a hundredfold in reaction from the slaughter of European shambles. Now is the time, therefore, to speak out. The gospel of clean living may be old stuff to those of you who have preached and practised it yourselves from day to day for decades. But it has taken on a glamour, a new meaning, a greater significance to the masses, and they are as children in their thirst after the truth. Take to them every day through the newspapers, the pulpit, the platform, and otherwise, the story of physical regeneration. Do not lecture or scold. The plainest statement of fact is enough. And when the facts have soaked in, as they must do with patient treatment, you will have your reward in a higher standard of public morals, and a race improved, physically and spiritually.

The public health officer who neglects the important feature of popular education through every available source of publicity is not visualizing his job. He overlooks the most potent influence for good, the most attractive and effective opportunity for enlisting the support essential for making his work a success and a beneficence to those whom he would protect from the pitfalls of ignorance and filth. Let your light shine.

The Value of Municipal Dairy Inspection

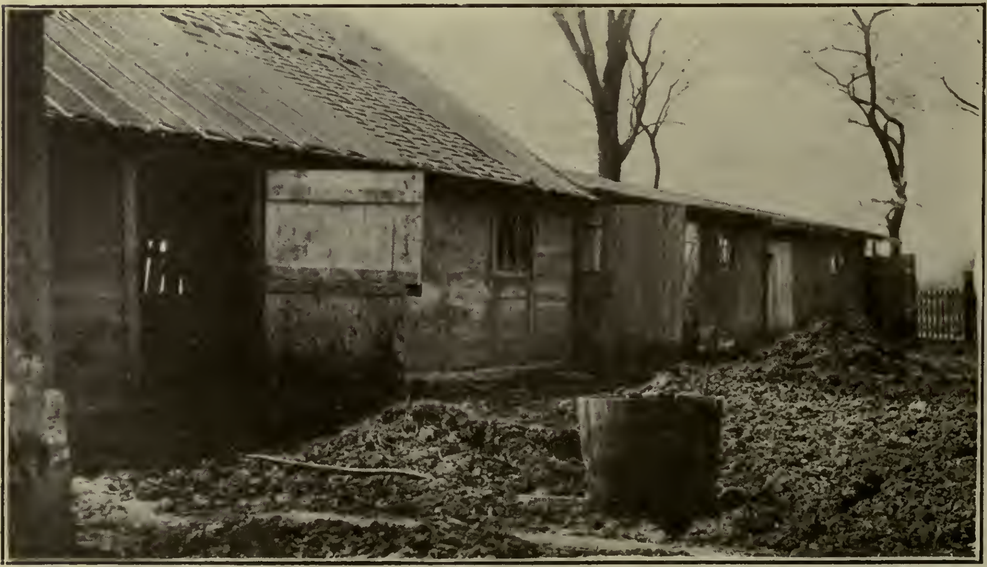
Constant Vigilance Necessary by Municipal Health Authorities to Ensure Clean Milk for Cities

By C. V. Craster, M. D.

Health Officer, Newark, N. J.

IT is only within recent years that the growing needs of large cities have required commercialization of the milk production industry upon a large scale. Milk, universally used as a food for young and old, has, however, for many years been suspected of being the vehicle of widely distributed epidemics of contagious diseases. The opinions of the theorists when applied to the practical production of milk have well borne out the deductions of the laboratory. It has been abundantly proved that when reasonable precautions are taken upon the farm a safe milk supply can be accurately predicted.

To obtain a reasonable standard of good milk the various municipalities adopted milk ordinances in which grades artificial in



CONDITIONS EXISTING AT A LARGE DAIRY BARN NEAR IRVINGTON, N. J., PRIOR TO INSPECTION BY NEWARK MUNICIPAL HEALTH AUTHORITIES

THE SAME BARN SHOWN ON PREVIOUS PAGE AFTER THE NEWARK HEALTH AUTHORITIES HAD REQUIRED A MORE CLEANLY DAIRY AS ONE REQUISITE FOR A PERMIT TO DELIVER MILK IN THAT CITY

classification attempted to put a higher value upon the product of clean dairies. Although there may be some criticism possible of the multitude of milk grades, the ultimate object of attempting to obtain a better price to the producer for a clean product cannot by itself be a harmful proposition.

Possibilities of Danger

It is evident that in framing a milk ordinance we cannot simply dictate a grade of milk in which the bacterial count shall be the only requirement. We cannot ignore the farm and the dairy, for after all it is at the point of production that the chief effort of influencing a milk supply must be directed. It is unfortunate in this connection that the public attitude has been in the direction of putting too much stress on the value of pasteurization. No one will question the value of this process in safeguarding a milk supply from the danger of infection with pathogenic organisms as well as in reducing the average bacterial count. The drawback to pasteurization is the tendency to produce habits of carelessness and slovenliness in the production of pasteurized milk. The farmer thinks it is all right for the pasteurizing to take care of everything in the way of dirt and bacteria. The same view is held by too complacent health authorities. The fact is that the pasteurization itself is a potential agent of infection and only by energetic and painstaking efforts can it be made to function in a clean manner. I would direct the attention of those health boards which are satisfied with their pasteurized supplies to keep a close watch upon the pasteurizing plants themselves.

No amount of grading by bacterial count can ever control a milk supply. Farm and dairy inspection is imperative. It has been the experience of the Newark, N. J., Department of Health that only by constant and careful dairy inspection can real assurance of clean milk be obtained. The experience with the tuberculin test for cattle used for raw milk production is a good example of the need for dairy inspection. Although tuberculin test sheets may be filed in the offices, inspections invariably reveal inaccuracies in the tagging of the cows. Cows do not correspond to the description of their numbers. It is a common experience to find cows in herds without tags, the cows having been recently added and no test having been made. We have had test sheets of cows that were in Canada when the test was made, but later were tagged as having been tested at the dairy. Tags originally issued for bulls have been found in the ears of cows. Cows showing gross physical signs of disease are at times picked out from herds and found tuberculous. It has been said that the bacteriological examination will reveal many of these conditions. In a mixed supply, however, the extreme dilution of pathological evidence will render a possible diagnosis unlikely, and this method will certainly not detect the tuberculous cow. The diseased cow is frequently hidden in the herd, its palpably "out of condition" appearance seldom attracting the attention of the milker or farmer.

The possibility of mischief resulting from a grading of milk by bacterial count alone is manifestly great. In protecting the milk supply from contamination it is very important not only to insure clean milk but also to remove as far as possible all potential agents of danger. Old and unclean cow barns must be improved, a pure water-supply for cows and utensils must be assured. The provision of proper apparatus for steam sterilizing all cans and containers is necessary on every farm. Up-to-date and efficient methods are essential for the quick removal of manure from cow barns, for the rapid cooling of milk and of keeping it cool till delivered at the railroad station. The railroad facilities for proper refrigeration also need attention. In the efficient carrying out of these requirements no single instrument has ever equalled the score card for dairies, creameries, receiving stations and pasteurizing plants. At this time the Federal score card is used for the first dairy inspection. This card scores by points, and results in conveying an excellent picture on the points scored.

A later adoption for subsequent scores is a yes-and-no card. No points are given. To one looking down the card the "noes" are very prominent, and show at a glance where the premises are deficient. The score card is a concrete instrument, it is tangible and shows the farmer where he fails to meet the requirements for a high score. It repays his study and attention, and it is our experience that after a few inspections the dairyman will take a real interest in the number of points he should or should not be credited with. The score card is an educating force of great usefulness and one of the best advertising mediums for the necessity of clean milk production.

It has been said that clean milk may be produced by skilled workers in the worst type of insanitary dairy by using proper methods of precaution. I am far from decrying the value to be put upon methods in milk production; at the same time this should not be over-emphasized. The same argument may be applied to human surgery. A clever surgeon could conduct a successful operation in a pigsty. We should not, however, suggest that all our operating rooms be pigsties; we could not afford to take such a chance.

In the control of a milk supply, strong-arm methods cannot be used as a continuous procedure. Many of our milk producers are endeavoring to do their best, and they very frequently appeal to the Department for information upon how to improve their methods and equipment. We have found good milk produced with poor equipment, and bad milk from a high-class farm. Where new barns and equipment are put in to improve a dairy score, clean methods are easily insisted upon. The old, unclean dairy, no matter how good the bacterial count of its milk, will always remain a potential danger to the supply; since the condition for contamination is present, only eternal vigilance will keep the product clean.

A recent example of how the bacterial count does not reveal the exact conditions surrounding the point of production came to our notice not long ago. A certified milk supply with a record of bacteria always well within the legal limit was found upon examination of the dairy premises to be far from meeting the requirements for certified milk. Diseased cows were found in this herd, where veterinary inspection was perfunctory. The premises were found to be unsanitary in certain directions, and the medical examination of employes was only irregularly performed. Regular dairy inspection of certified, raw and pasteurized milk dairies by the Newark Department has revolutionized the type of barns and equipment used for milk production. "Before and after" photos of alterations in dairy premises as the result of inspection are astonishing.

The Farmer's Attitude

It is extraordinary to what lengths the farmer will go when he sees the necessity of improvement. In recent years many old objections have been swept aside, and new truths have been accepted by the farmer, who has been shown that his best interest is in providing clean milk. For what has been accomplished credit must be given to the score card. Without it our efforts would have been useless. A definite statement of what was required to be done was asked and supplied. There was no generalization of criticism; it was nailed down to a few simple facts which could not be gotten away from.

In the raw milk dairies alone the regular inspection during the five years has reduced the tuberculin reaction from 15 per cent of tested herds to less than 4 per cent, the average found at this time.

No small part of the spectacular result is due to the requirement for the testing of all new cows added to a milk herd. The farmer with a high bacterial count in his milk will frequently throw up his hands in despair, and only by practical inspection on the farm itself can the cause of high bacterial counts be found. The demonstration by the Department inspector is a graphic lesson, and no amount of office suggestions will compare with it in value.

Quite recently a farmer with an up-to-date plant had constantly high counts, which he expressed himself unable to improve. A visit to the premises showed nothing wrong with the methods or the equipment. A culture taken, however, from sterilized milk bottles showed a high bacterial flora, which at once indicated where the fault lay.

Clean milk is not a commercial dream, it is within the possibilities of the most rudimentary methods of cleanliness. The instructions and suggestions must, however, in my view, be made upon the farm. Insistent and consistent efforts to improve the scores of equipment and methods of milk production will usually bring about great improvements in dairy hygiene.

As an indication of the improvement in the milk supply of Newark resulting from efforts along these lines, by putting a most liberal interpretation upon milk ordinances and allowing all grades of milk a maximum of 100,000 bacteria per cubic centimeter, the following is the percentage of milk samples conforming to this standard.

Years	Samples Tested	Under 100,000
1913 1914 1915 1916	5,343	66%
1917	3,261	74%
1919	.....	69%

Continuous inspection upon the farm, at the milk station and at the pasteurizing plant is the price we must pay for a reasonably safe milk supply. It is a charge given by the public to the boards of health. They may well say, "See to it, gentlemen, that our trust is not misplaced."

Acknowledgment.—From a paper read before the New Jersey Sanitary Association

ROAD MACHINERY OWNED BY BALTIMORE COUNTY

Districts	Rollers	Crushers	Tractors	Concrete Mixers	Road Scrapers	Road Drags	Road Plow	Scarifiers	Water Sprinklers	Tar Kettles	Gasoline Pumps	Motor Trucks
1	(1) Monarch No. 3317								(1) Gem Sprinkler	(2) Tar Pots 80-Gal. Pot 50-Gal. Pot	(1) One Pump	
2	(1) Buffalo Pitt No. 1028 1st Dist. Roller				(1) Climax Scraper					10-Gal. Pot 100-Gal. Pot 50-Gal. Pot (3) Tar Pots		
3	(1) Kelley Roller (1) Gasoline Roller No. 080 (1) Buffalo Pitt No. 3458			(1) 5 cu. ft. Mixer		(2) Sweepers	(1) Road Plow		(1) Sprinkling Cart	(1) Tar Pot 50-Gal. Pot	(1) One Pump	(1) Internat'l Truck (1) Auto Car. Oiler
4	(1) Kelley No. 3024	One New Holland 8x9		(1) 5 cu. ft. Mixer	(1) Climax Scraper		One		One	(1) Tar Pot 10-Gal. Pot	(1) Hand Pump	
5					One	Two						
6	(1) Buffalo Pitt No. 8259		(1) Fordson Tractor	(1) 5 cu. ft. Mixer	Two	One			(1) 4-Wheel Sprinkler		(1) Pump & Jack (1) 1½ H. P Pump	
7					Two	One			One			
8	(1) Kelley No. 3039				One		One		One	(1) Tar Pot 10-Gal. Pot	One	(1) 1-T. Service Truck
9	(1) Olser No. 3138 (1) Buffalo Pitt No. 3175				One				Two	(5) Tar Pots 4 10-G. Pots 100 Gal. Pot		(1) Auto Car. Oiler (1) Internat'l Truck
10	(1) Monarch	One Climax 9x12 One New Holland 8x9	(1) Interna-ti'al Tractor		One		One					
11	(1) Kelley No. 2242		(1) Huber Tractor		Two	One	One		One	(1) Tar Pot 90-Gal. Pot	One	
12	(1) Russel		(1) Fordson Tractor		One	Sweeper				(1) Tar Pot 60-Gal. Pot		
13	(1) Kelley No. 2130				One	Two	One	One	One	(1) Tar Pot 60-Gal. Pot		
14	(1) Kelley		(1) Fordson Tractor		One				One		One	
15	(1) Monarch No. 23070			(1) 5 cu. ft. Mixer	Two	Two			One	(1) Tar Pot 50-Gal. Pot	One	
J. Harrison				(1) 5 cu. ft. Mixer							One (1) Tim Force Pump	Service Truck Chevrolet Tng. Car
E. T. Maye				(1) 5 cu. ft. Mixer							(2) 1½ H. P Pumps (1) 4 H. P. Force Pump	(2) Nash Quad Trucks
Totals	16	2	5	6	17	3 Sweepers 9 Drags	6	2	12	12	1 Hand Pump 12 Gas Pumps	(8) Trucks (1) Touring Car

Training the Probation Workers of the Municipal Court of Philadelphia

By Leon Stern

Educational Supervisor, Municipal Court of Philadelphia

THE educational work of the Municipal Court in Philadelphia has for its aim the training of the probation staff, who are the social workers of the court, and the developing and discovering of new and better methods of doing the social work of the Court in order to attain the maximum of service for its clients.

The Municipal Court is a socialized court which has, besides its Civil Divisions, a Domestic Relations Division, a Juvenile Division, a Misdemeanants' Division and a Criminal Division.

To the Domestic Relations Division come the cases of non-support; wives whose husbands are not supporting them; aged parents seeking support from their children and children whose parents are evading responsibility. To the Juvenile Division are brought the children under sixteen who are delinquent, neglected or dependent. To the Misdemeanant Division come the incorrigible boys and girls between the ages of sixteen and twenty-one, and also women arrested for street walking. To the Criminal Division are brought the men and women arrested for petty crimes, and here are also prosecuted the fathers of illegitimate children in order to protect the unfortunate mothers and babies.

There is also a Medical Department for the clients and probationers who need physical diagnosis, neuro-psychiatric or psychometric diagnosis, or at times venereal diagnosis, in order to better understand the best social treatment for the solution of their difficulties.

All this work requires technique and skill. This necessitates training for the staff members who handle the problems, and also constant acquaintance with new developments in the field of social service for those who are already trained. One important function of the Social Service Department is to supply training helps for the social service staff of the court. This is a task which presents peculiar difficulties in public social service because public social service is very new, which implies that standards must be built and principles laid down. Even when the worker has previous training, he or she must be given the information to adapt his or her training to the special requirements of the public social service. Therefore the Municipal Court has developed a special plan of training for these workers. This is accomplished by the following means:

1. *Interne-ship* of the worker under the supervision of his or her case-supervisor. Case conferences are part of the staff work.

2. *Special Training.* A number of workers, probation officers and supervisors joined in a plan to take training at the Pennsylvania School for Social Service. Here they take courses in case work, children's work, work with adolescent girls and psychiatric work. These courses are made financially possible by the coöperation of public-spirited citizens.

3. *Court Lectures.* For the year 1919-1920 the Municipal Court inaugurated a series of addresses concerning the public service. Leaders in the field of public service addressed the staff and the social workers of Philadelphia, who are engaged in similar work, on subjects that deal more largely with the field of public service.

The meetings were presided over by Hon. Charles L. Brown, President Judge of the Municipal Court. Discussion followed the meetings and announcement was made concerning the progress of the students attending the special training courses. All probation staff and social workers have been informed by the President Judge that it is part of their duty to attend.

4. *Social Service Directory of Philadelphia.* This was described in THE AMERICAN CITY for April, 1920, page 374.

5. *Sociological Library.* A library on sociological and law enforcement literature has been collected so that it is possible for the court official to have at hand all the latest scientific and general books to help guide the worker in the social service which he or she renders to the community. This library will also collect pamphlet literature, and is open for research to all who are in-

terested in the socialization of the court and law enforcement processes.

6. *Developmental Research.* Another educational task is to make research studies of the actual operation of the court in order to supply information as to new needs. This work is similar to the commercial research in factories and business of scientific processes and methods of operation. For example, a study was made of the collection of court orders of the unmarried mothers' cases. It was discovered first that it would be helpful to have a woman probation officer help the man probation officer in enforcing the collection of the orders made, because the women very often were too reserved to prosecute the claim. It was also discovered that the probation officer could open up new avenues of coöperation. A study was also made as to whether the civil division could use the methods of the Domestic Relations Division workers and settle disputes involving small sums of money by conciliation rather than by litigation. As a result such a plan will be put into effect by the President Judge and the Board of Judges.

7. *Probation Manual.* A Probation Manual has been about completed giving a digest of laws and a summary of social procedure, and outlining technique for the use of the staff in the Domestic Relations, Juvenile and Misdemeanants Divisions of the Court.

8. *Exchange of Information.* As new methods are applied and found successful, the information is passed on to the other courts and agencies.

The Increased Cost of City Government

EIGHT causes for the increase in the cost of city government and eleven recommendations for retrenchment are contained in a report to the New York Legislature by the Special Joint Committee on Taxation and Retrenchment, of which Senator Frederick M. Davenport is chairman. The report is a comprehensive document on city government and is the result of what is generally conceded to be the most thorough investigation of municipal affairs ever made by a state legislature.

The committee reports that the causes for the increased cost of city government are the very rapid increase in the appropriations for education, the extension of government in new fields of activity, the need for extended city improvements, the expansion of municipal service, the desire of city department heads to expand their departments, the new price level, inappropriate and poorly functioning governmental organizations, and inefficiency and waste.

The present plan of city government, according to the report, is in most of the cities in New York fundamentally unadapted to produce efficient and economical administrations. Three definite conclusions are reached:

1. The most effective and economical plan of city government is one in which all executive functions are centralized under a single executive directly responsible to the electors.

2. The maximum amount of latitude should be allowed local authorities in prescribing departmental and internal organizations of city government.

3. Any system of unpaid part-time service tends to be uneconomical and ineffective, and all service should, as a rule, be paid service.

The Legislature is urged to adopt a definite policy in respect to city charter proposals as follows:

1. The Legislature should discourage the proposal of any charter legislation tending to decentralize materially the government organization of any municipality.

2. Charter proposals for unpaid or nominally paid administrative officials should be discouraged.

3. No charter should be granted by the Legislature which prescribes the appointment and fixes the salary of administrative officials or prescribes in detail the assignment of functions of government to administrative departments.

The committee finds that the present separation of power and responsibility in school administrations is an "inherently wasteful system," and it urges the appointment of a committee to consider the entire problem of the relation of school administration to city administration. Continuing, the report says:

Another recommendation is the entire

revision of municipal pension systems, as most of the city retirement funds are on the verge of bankruptcy because of unsound laws. Non-contributing pension systems should be abolished, the committee says, all systems should be put on an actuarial basis, the city and the employe should share the expense equally, and the retirement age and length of service should be such as to prevent existing abuses.

The committee informs the Legislature it is convinced that few New York State cities are purchasing economically. The methods in most cities, it finds, are antiquated and wasteful. The establishment of central purchasing by the cities is recommended.

An exhaustive investigation of the effect of tax limitations on the cities of New York and other states as made by the committee has had the result that it recommends the abolishment of tax limits as soon as "simplified, centralized governmental organization with the budget" can be secured. The conclusions of the committee are that tax limits do not limit, that they tend to increase the cost of city government, that they encourage unsound bonding and that they have not prevented cities from maintaining about the same governmental service at about the same cost as other cities of the country.

Among the other important recommendations in the report are the following:

"The methods of assessment throughout the cities of the state and the equalization of assessment are almost universally unsatisfactory. The enactment of a law which will permit third-class cities and require second-class cities to reorganize their assessment offices, and a constitutional amendment which will authorize the legislature to improve equalization methods, are recommended.

The growing proportion of exempt property in the various taxing jurisdictions has become a serious problem. The appointment of a joint committee of the Legislature to make a legal and statistical study of the subject of tax exemptions in New York State is recommended."

The conclusion of the committee in respect to county government is that it is gradually breaking under the increasing weight and complexity of administrative work." It is recommended that the proposed amendment to the constitution authorizing the Legislature to provide a reconstruction county government where it is necessary be passed at this session of the Legislature.

"The present relation of city and school is far from satisfactory. It must be changed in the interests of education no less than in the interests of city government. This fact is recognized by the State Department of Education as well as by the mayors of our cities. In our judgment, whatever reorganization is finally worked out, the change must make our schools democratic, efficient and economic. To be democratic, the schools must be under the direction of locally selected authorities. To be efficient, the schools must meet standard minimum educational requirements to be determined by the people of the state as a whole through the State Legislature and the State Department of Education; and the schools must be 'kept out of politics,' both municipal and education, through the appointment of the board and the adoption of sound business methods in the purchasing of supplies, the management of the personnel, and the construction of buildings."

The committee states that in order to be economic, the reorganized school administration must provide for:

1. The unification of the power to fix the school budget and direct responsibility for levying and collecting the school tax.
2. The review of school budgets by those who do not spend the school money.
3. The review of school budgets in comparison with the budgets of all other city services, and the determination of school appropriations in comparison with the proportion of the needs of the public for governmental services and their willingness to pay.
4. The administration of the schools in corelation with the other governmental functions of the city which can work most economically through the common utilization of the plan.
5. The administration of the school in corelation with those departments of the city government which by their service to the department of education can make the payment for expensive special service unnecessary.
6. The purchasing of all school and municipal supplies through a single department or agent.

A majority of the cities are not operating under a genuine budget system. The present bonding laws are condemned for not prohibiting unsound and wasteful municipal bonding. The committee recommends the enactment of a budget act and a bonding law.

The investigation brought to light the fact that several millions of dollars are being expended by the cities for interest which might be saved through the collection of taxes earlier in the year. The advancement of tax collection dates is advocated.

Another recommendation is the entire revision of municipal pension systems, as most of the city retirement funds are on the verge of bankruptcy because of unsound laws. Non-contributing pension systems should be abolished, the committee says, all systems should be put on an actuarial basis, the city and the employe should share the expense equally, and the retirement age and length of service should be such as to prevent existing abuses.

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The conclusion of the committee in respect to county government is that it is gradually breaking under the increasing weight and complexity of administrative work.

An Ancient Nuisance Comes Again

Already, . . . the swinging of the so-called campaign banners across the city's streets has begun. In a few weeks, if the custom of former years is to be followed, there will be innumerable such utilizations of public property for what, in a sense, is in each case a purpose which, though not exactly private, at least appeals to only a part of the public and therefore is subversive of general rights.

The matter is one that deserves the serious consideration of our municipal authorities. It would, indeed, take not a little courage for them to forbid entirely this sort of advertising, but for such action they would have good reasons as well as good excuses.

The banners, in the first place, clearly come in the category of street obstructions. Then, they are ugly—libelous, almost always, of the candidates they attempt to picture—and they are a perfectly useless expenditure of a lot of money, for not even the most hardened of politicians would dare to pretend that ever a single vote was won or changed by a campaign banner. There is an appreciable element of danger, too, in having these huge and often heavy contraptions swung across the streets. Not infrequently their poles give way or their ropes break in high winds.

The one justification for the existence of campaign banners is that they have existed, but nobody—except the sign-painters—really likes them or really thinks them a help toward political victory.—*N. Y. Times.*

The Motorized Departments of Spokane, Washington

Accurate Cost Data Secured by Careful Records

By H. F. Nelthorpe

SINCE the motor-driven vehicle has found its way into commercialism, it has also found its way into the workings of municipalities to the extent that the slow-plodding horse is almost a thing of the past. Instead of the noise of the iron hoof, we now hear the buzz of the motor—which we still have to water, however, and blanket in winter.

The city of Spokane has realized the efficiency of motorizing, and now has over 100 motor-driven vehicles in service. In the Fire Department there are thirty-one motor trucks, consisting of four hook and ladders, one chemical wagon, five engines, four combination hose and pumpers, eight combination hose and chemicals, two hose wagons, and seven other vehicles for the Chief and his assistants. Thirteen of the vehicles were built by the firemen themselves, five were transformed from horse- to motor-driven, and the remainder were purchased. The cost of maintaining these vehicles in 1919 was only $3,343.11, a figure considerably lower than the cost of caring for a sufficient number of horses to haul the same equipment. The firemen maintain their equipment with the help of the master mechanic and under the personal supervision of Chief A. L. Weeks.

The Police Department has one combination patrol and ambulance, one high-power motor for emergencies, and a Ford for detective work, which are also maintained by the Fire Department, the whole costing $2,884.83 for 1919.

The Health Department has a fleet of eight cars, three of which are the personal property of the Health Officer and his two assistants. The remainder are Fords used by food, milk and sanitary inspectors, the Contagion Hospital and patients. The expense for this fleet was $4,581.80 in 1919.

The superintendent of the incinerator has a fleet of nine trucks: one 3½-ton Packard, one 2-ton GMC, one 2-ton Federal, one 1-ton Indiana, two 1-ton Smith Form-a-Trucks, one ¾-ton Reo, all for hauling garbage, refuse and carcasses, and two Fords for the superintendent and his assistant. The cost of maintaining these machines for 1919 was $4,943.18.

The City Engineer has a Dodge car for his personal use, and two Fords for his assistants, costing $708.64 for maintenance in 1919. The Dodge was not purchased

TABULATION OF COSTS OF OPERATING SPOKANE'S MOTOR FLEET

Motor No.	Make	Capacity Tons & Pass.	Years in Service	Purpose Used For	Days worked	1919 Mileage	Average mile per day	Total cost per mile	Cost per mile for gasoline	Total cost for gasoline	Total cost for oil.	Total cost for grease	Cost of new tires	Accessories Insurance License	Mechanical Labor	Repair Material	Rep's to Body Labor	Rep's to Body Mat'l	Painting Labor	Painting Mat'l	Total Labor	Total Material	Grand Total
1	Packard	3	9	Str.Clng	215	5375	25	21	07	395.31	50.76	7.20		30.00	409.00	194.92	34.00	5.31			443.00	683.50	1,126.50
2	Packard	3	8	" "	176	4048	23	31	09	366.56	40.08	7.75		1.50	419.00	436.96	2.00		6.50		427.50	852.85	1,280.35
3	Built by City	4	5	Sprinkling	123	3321	27	41	11	362.95	51.63	8.68	355.39	34.00	270.50	130.68	120.45	113.38			390.95	957.09	1,347.66
4	" " "	4	5	Repairing	106	3074	29	32	09	266.87	71.86	7.65		.19	282.50	239.75	27.00	41.86	47.00	6.42	356.50	634.60	991.10
5	" " "	4	5	Cleaning	139	4170	30	31	08	339.67	60.06	7.00		40.20	410.00	163.45	140.00	97.58	26.00	8.98	576.00	716.94	1,292.94
6	" " "	4	5	Sprinkling	112	3024	27	25	08	253.22	60.21	3.08		34.39	186.10	98.02	65.00	43.57			251.00	492.49	743.49
7	" " "	4	5	Repairing	120	3480	29	34	07	233.08	32.26	10.63		36.46	522.50	291.20	41.50	9.75			564.00	613.38	1,177.38
8	" " "	4	5	Cleaning	127	3225	25	27	09	310.37	46.28	4.60	153.66	38.20	221.00	68.58	33.15	1.30	7.00		263.75	620.39	884.14
9	" " "	4	5	Sprinkling	159	3452	28	49	13	457.77	88.98	9.47	216.17	35.69	307.50	238.51	178.17	112.50	31.50	8.49	517.17	1,167.58	1,684.75
10	" " "	4	5	Repairing	115	3105	27	41	09	276.57	25.84	1.65		35.70	596.00	315.85	9.00				605.00	655.61	1,260.61
11	G.M.C.	2	2	Cleaning	181	5973	33	16	05	316.77	17.84	3.60		15.27	135.00	51.92	108.00	229.86	56.50	13.43	299.50	648.69	948.19
12	Built by City	4	5	Sprinkling	108	2612	24	37	10	256.18	46.72	9.65		35.77	334.25	184.99	35.25	3.75			369.50	537.06	906.56
13	" " "	4	5	Repairing	170	5270	31	23	09	458.36	35.66	10.60	153.66	35.50	332.75	77.10	108.90	12.94	7.50		449.15	783.82	1,232.97
14	" " "	4	5	Cleaning	228	5700	25	20	09	491.72	41.18	8.30	153.66	2.50	208.50	152.54	26.80	50.74			235.30	896.14	1,131.44
15	" " "	4	5	Sprinkling	287	6314	22	24	10	619.72	94.31	15.35	62.51	5.76	301.00	202.93	91.50	105.42			392.50	1,106.00	1,498.50
16	Smith Form A	1	4	Repairing	300	5400	18	10	04	119.67	36.72	7.20	101.24	5.71	102.50	86.55	2.00	13.65			104.50	450.74	555.24
17	Signal	1	6	Cleaning	302	8828	29	09	04	378.93	80.37	3.00	89.79	28.00	87.25	77.52	5.05	3.71			92.75	661.32	754.07
18	Built by City	5	3	Repairing	110	3300	30	62	11	352.47	76.06	4.95			464.50	186.89	474.00	418.75	50.50	9.54	989.00	1,048.66	2,037.66
19	G.M.C.	1	2	Repairing	301	10531	35	08	04	462.00	36.12	5.68	84.08	2.99	81.00	43.96	111.00	68.30			192.00	703.13	895.13
20	G.M.C.	3½	2	Sprinkling	210	6510	31	22	08	503.99	51.84	15.25		20.00	269.00	343.08	134.20	30.40	40.20	10.07	443.40	974.63	1,418.03
21	G.M.C.	3½	2	Repairing	240	7200	30	15	08	565.66	51.50	11.60	1.80	40.52	152.50	75.10	128.30	28.76	3.00		283.80	774.94	1,058.74
22	G.M.C.	3½	2	Sprinkling	243	6804	28	16	07	554.67	47.69	7.30		24.68	150.75	87.26	171.25	20.74	2.50	.13	324.50	742.47	1,066.97
23	G.M.C.	3½	2	Repairing	210	6720	32	22	07	467.81	57.84	26.75	346.28	26.75	201.00	66.81	193.50	70.88	32.50	5.31	427.00	1,049.38	1,476.38
26	Ford	2 P.	8	Supt.	310	8681	28	07	02	171.89	21.32	.50	81.81	18.23	119.50	111.72	10.50	50.34		1.11	130.00	456.92	586.92
27	Ford	2 P.	5	Inspections	365	10290	28	05	02	190.41	15.76		137.13	26.65	79.50	55.20	2.00	14.87			83.50	438.02	521.52
28	Ford	2 P.	6	Emergency	365	12835	35	07	02	266.07	24.56	.10	161.08	25.30	180.00	170.98	21.00	12.85			201.00	660.94	861.94
61	Ford	2 P.	4	Sewer Insptn	300	5858	19	05	02	115.18	12.08		36.82	7.83	68.50	66.82	1.00	.30			70.00	238.58	308.58
62	Smith Form A.	1	3	Sewer Cln'g						307.21	70.64	2.14	66.91	10.80	163.75	131.76	23.75	37.51			187.50	626.97	814.47
63	G.M.C.	2	4	" "	300	3686	13	08	05	195.42	17.47	4.26		36.35	45.00	18.18	21.00	1.49			66.00	273.17	339.17
65	Ford	2 P.	1	Paving Supt.	200	3529	17	10	03	116.01	12.88	.90	70.28	13.96	85.10	55.00		13.51			85.10	282.54	367.64
66	Federal	1½	4	" Repairs	200	6391	32	28	06	336.05	60.99	11.65	354.45		403.50	382.80	132.50	210.91	25.00		561.00	1,413.05	1,794.05
76	Yuba Tractor		4	Str.Grading						313.73	79.10	37.85		3.31	471.50	1,167.61					471.50	1,597.10	2,068.60
77	Yuba Tractor		3	" "						551.44	110.14	39.59		2.20	1,296.00	2,329.69					1,296.00	3,033.06	4,329.06
78	Holt Tractor		½	" "						127.81	31.96				78.00	16.65		44.00			78.00	220.42	298.42

A 2-TON GMC TRUCK USED IN SEWER CLEANING FOR FOUR YEARS IN SPOKANE. IT COST ONLY $339.17 FOR MATERIAL AND LABOR FOR MAINTAINING THE TRUCK IN 1919

until the latter part of 1919.

The Weights and Measures Inspector has a Ford that cost him $233.69 to run in 1919. The Claim Agent's Ford cost him $440.15 to maintain in 1919. The Plumbing Inspector's Ford cost him $668.07 for 1919.

The Superintendent of the Water Department uses a Dodge car, and he has two Harley-Davidson motor-cycles for men who turn the water off and on, two for his meter readers, four Fords for those who repair and install water meters, and one Reo car for his water survey engineer; also one 3½-ton Packard, one 3½-ton truck that was built by the Fire Department, and two Ford trucks, all used for general repair and construction of water-mains and hydrants. It cost the department $5,466.31 for maintenance in 1919.

The Department of Public Works has a fleet of thirty-four pieces of motor-driven equipment which it cost $39,059.17 to operate and maintain in 1919. Two Packard 3½-ton trucks that were used for street cleaning have been replaced by two GMC trucks. Twelve 4-ton trucks that were built by the Fire Department are used for sprinkling in the summer and for street cleaning and repairing the remainder of the year by removing the tank and putting a box in its place. The motor equipment also includes the following: one 2-ton GMC truck for street repairing; one 1-ton Smith Form-a-Truck for repairing streets and cross-walks; one 1-ton Signal truck for hauling oil to the contractor on street repair work; one 5-ton truck, built at the city garage, used for sprinkling and repairing; one 1-ton GMC truck for street cleaning; four 3½-ton trucks used on sprinkling, cleaning and repairing; three 2-passenger Fords for the Superintendent and two emergency men and inspectors; one 2-passenger Ford for the Inspector of Sewers, one 1-ton Smith Form-a-Truck for hauling tools and hose around to clean and flush catch-basins and sewers—replaced this year by a GMC truck; one 2-ton GMC truck for hauling refuse from the catch-basins; one Ford 2-passenger car for the use of the Paving Superintendent; one 2-ton Federal truck for hauling paving material. Another GMC truck has been purchased for 1920, also two Yubas and one Holt tractor for the regrading of the unpaved streets.

Most of this equipment is maintained at

the city garage, which employs about ten men, and cost to maintain in 1919, $6,160.58. The garage also has a Ford for its own use.

The area of Spokane is 30.25 square miles. The city has 70.54 miles of paved streets, 1.45 miles of paved alleys, 395.63 miles of graded streets. The estimated population is 120,000.

Special blank forms are used to record gallons of gasoline or distillate consumed, oil, grease, tires, accessories, mechanical and body repairs, tires, and painting. These data are kept on monthly sheets in the form of a loose-leaf ledger. A tabulation of the annual figures for 1919 is shown on page 180. The chauffeurs are paid at the rate of $5.20 per day, but this is not included in the statement. The shopmen are paid from $5.20 to $7.00 per day.

YUBA TRACTOR HAULING LIGHT GRADER IN REGRADING WORK IN SPOKANE, WASH.

The Tractor in Modern Road Construction

This Valuable Piece of Machinery is a Veritable Jack-of-All-Trades

IN its present high development the tractor is used to grade, scarify and drag the road, to haul and furnish power for a rock crusher if necessary. It does its work cheaper and faster than any other available source of power. Tractors of all sizes are used with road graders.* When a new road is being broken, large tractors are absolutely essential, and tractors with at least 20 horse-power effective draw-bar pull are generally used, while smaller tractors are less expensive for maintenance work. The horse has been practically eliminated for hauling heavy graders, because it takes a large number of horses to pull a grader of any considerable size, and unless the horses have been trained to work together they do not pull effectively as a single unit. Furthermore, it requires an expert driver to get the best work out of the various teams so that they will produce the best results. The tractor packs the new road to advantage, and where necessary can run in the center of the road and efficiently haul a grader which is running along the shoulder. When a tractor is pulling the grader, a uniform depth of cut can be maintained, while with horses the grader operator is apt to ease up on the work a bit in order to help the horses over a hard piece of road.

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* The subject of tractors used to haul heavy blade graders was discussed at length in the Town and County edition of THE AMERICAN CITY, June, 1919, page 524.

Graders for use with tractors are now made varying from 6 to 12 feet in length, the blades being reversible so that the dirt can be removed to either side of the road. The blade can also be set at any angle and tilted as desired.

Some types of tractors have special offset hitches to make it possible to work the road with a tractor, where otherwise it would be very difficult and in some instances impossible. With good traction, the tractor can exert full draw-bar power, while when it becomes necessary to operate the engine on the shoulder of the road, a great deal of power is lost and the grader cannot be used to its full capacity. Also when the tractor is at the side of the road, there is always danger of upsetting.

With an offset hitch, the engine can remain on the center of the road while the grader is from 6 to 8 feet to either side. Another important advantage is the fact that the grader can be guided independently of the engine. The grader's steering wheel is placed convenient to the operator, combined with the hitch. The draw-bar pole on the grader is pivoted at the rear and is held in position by a rack and gear, the latter being operated by the steering wheel.

Grading Operations

There are several ways of hitching tractors to graders. In the case of the single grader hitch, it is attached directly to the draw-bar of the tractor or through a chain or rigid bar. A horse grader can be used with a tractor, using the single hitch. Some operators connect the draw-bar of the tractor to the frame of the grader by a chain or bar, then a rope is attached to the grader, which runs forward through a pulley on the draw-bar cross-angle and across to the end of the tongue, thence to the other end of the draw-bar and through a pulley to the driver. By pulling on this rope, the grader is guided.

Another hitch is used when tractors pull graders in tandem; the front grader may be attached directly to the tractor draw-bar or to one side of an evener, while the rear grader is connected directly to the front grader or to the draw-bar or evener by a cable. A variation of this is to have the graders coupled one behind the other and have the front grader equipped with a steering device and attached to the tractor by the offset hitch.

Two graders may be pulled abreast, keeping them a given distance apart by a beam which extends crosswise in front of the tongue. Still another method to keep two graders abreast is to connect each grader to the tractor by a cable and have each grader equipped with a steering device.

J. T. Donaghey, Maintenance Engineer of the Wisconsin Highway Commission, in a published statement recently gave the following interesting and valuable data with regard to the use of tractors in Wisconsin:

"Tractors are used extensively in Wisconsin for road making and repairing. They are used to a lesser extent for road maintenance, although there is a field for the small tractor in that line.

"We have three types of roads in Wisconsin —dirt, gravel and concrete. A few years ago we built, with state aid, considerable macadam road, but have since found that the up-keep on that type of road is too great, so do not recommend it any more. The tractor is used extensively for plowing, scarifying, grading, hauling and crushing.

"When a dirt road is built, the tractor is the best thing there is for pulling the grader. Its big advantage lies in the abundance of power at hand to move a full blade of dirt to the center of the road, and then on the return the tractor packs the dirt down. It makes possible the making of good ditches at each side of the road, something that is not possible with horses. The horses have to walk directly in front of the grader and it is easy to see that in most places where the ditch is being graded it is impossible to use horses.

"In northern Wisconsin we recently have made a great many new roads through the forest and also through the cut-over land. In every instance we have found the tractor of inestimable value. We use the tractor to pull out the trees and stumps, plow the roadway and then grade. We have graded land that was full of roots. The blade of the grader would cut off the large roots like a knife when pulled by the tractor. In this way we saved time and expense. Where the gravel road is made we use the tractors for grading, hauling and packing. The tractor is specially efficient in hauling the elevator grader in grading cuts or fills. In sections of Wisconsin where the roads are especially stony and the land is very rough, we do not find the tractor a great advantage over horses, as the stones jolt and jar the machinery so much that there are many breakdowns.

"There is considerable use of the tractor for belt power for rock and gravel crushers. Here, however, the power requirements are not as high. In a number of sections tractors are being used for crushing that have been nearly worn out doing field work but are still very good in the belt.

"The chief advantage of the tractor over horses is not alone in lessened costs, which, by the way, is a great deal, but in the fact that the tractor can accomplish so much that the horses cannot do. I see a great future for the tractor for road work in Wisconsin. A new law has just been put through whereby each township is to have a road superintendent who will have charge of the road construction. In addition we are going to spend an amount equal to three times the national aid fund allotment for Wisconsin on roads. That means there will be vast sums of money spent on road machinery. As it is impossible to get horses enough, even if we cared to, to do this, the tractor will be used extensively. As the counties have bought tractors, so now will the townships buy, only in larger numbers."

In Rock County, Wis., where tractors have been used extensively, roads were built before the war for about $1,300 a mile, including all operations. The tractors were used for pulling scarifiers and blade graders, for hauling gravel from the pits and for furnishing belt power for rock and gravel crushers and screens. The foundation was made by plowing and grading the loose dirt out from both sides of the road. The trench thus formed was made 9 inches deep at the side where the wheels go, and 6 inches in the middle. The road was completed by hauling fine sand and gravel and compacting well by rolling.

Vilas County, Wis., has used tractors very extensively for grading and patrol maintenance. In 1918 there were 18.96 miles graded but not surfaced, and 3.79 miles graded and surfaced at a cost of $654 a mile. This included 51,855 cubic yards of earth moved at a cost of 29 cents a cubic yard. The average excavation per mile was 2,280 cubic yards. In Nebraska in 1913 the cost of grading with tractors alone was $18.50 a mile. This figure is for a 30-60 tractor pulling one grader and doing an average of 1.47 miles a day. The cost of tractor, engineer, operator and grader was about $28 per day. A fair price for pulling two graders with a tractor previous to the war was about a dollar a mile for each foot in width of grade. In a report made the last of January, 1918, D. R. Davage, District Engineer at Windom, Minn., gave the following costs for running a blade grader outfit:

Engineer, per day	$5.00
Head grader man, per day	5.00
Road grader man, per day	3.50
Stone digger	$3.00
50 gal. gas (maximum amount) at 20 cents	10.00
3 gal. standard gas engine oil, retail price 50 cents	1.50
Blacksmithing, sharpening blades, etc.	2.00
Depreciation and interest estimated (that is, for 100 working days in season) and the outfit to last four years	15.00

The Tractor Used With Other Road Machinery

Scarifiers are another class of road machinery successfully handled with a tractor. The scarifier is a machine made of iron and steel which frequently weighs as much as 5 tons. It is used for breaking up old road surfaces preparatory to relaying macadam, brick or bituminous surfaces. One design of scarifier is steered independently of the hauling tractor and can turn around in its own tracks. The teeth or tynes are pointed at both ends and can be raised or lowered instantaneously by a lever. The angle at which they enter the ground can be varied to suit different conditions, and they are adjustable for wear and depth of cut without jacking up the main frame. One record shows that the cost of scarifying with the tractor was $15, while the cost with horses was in the neighborhood of $200 a mile.

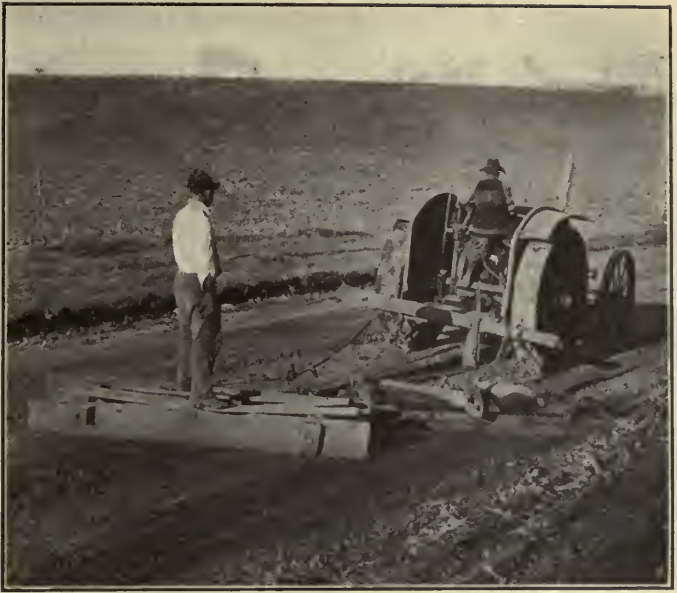
Road planers and finishers may be hauled by tractors, and some of the larger machines are designed to grade an entire road at one trip, leaving a uniformly crowned grade with a smoothly rolled, compact-finished center. In order to accomplish this, the machine is built with two long scrapers which smooth off both sides of the grade, bringing the earth to the center, and in the middle there is a scarifier which cuts off the high places in the center, and the roller in the back between the wheels compacts the loose earth. Tractors in all sizes are used extensively to pull road drags and planers for road maintenance or for finishing new roads.

Tractors for Hauling

Instances are known where there has been a saving of as much as 25 cents a yard in using tractors for hauling materials. In one instance the tractor hauled four 8-cubic-yard wagons loaded with crushed rock weighing from 2,500 to 2,800 pounds to the yard a distance of 3 miles, each outfit making three round trips per day at a cost of 20 cents a cubic yard.

The Tractor as a Power Plant

The tractor may be used to furnish belt power for crushers and elevator screens in connection with bins. The crushed stone or gravel is graded at the crushing plant, delivered in bins and discharged from the different compartments according to the sizes and quantity required. The frame of the revolving screen is adjustable at each end in order to regulate the flow of material traveling through the last screen section. One typical screen is a hollow cylinder of perforated metal. The openings in the screen are ½-inch, 1¼-inch and 2½-inches in diameter. All stones larger than 2½ inches pass over the perforations and drop out at the end of the last screen section.



TRACTORS OPERATING ROAD DRAGS AND GRADERS ARE PROVING ECONOMICAL IN MANY COUNTIES

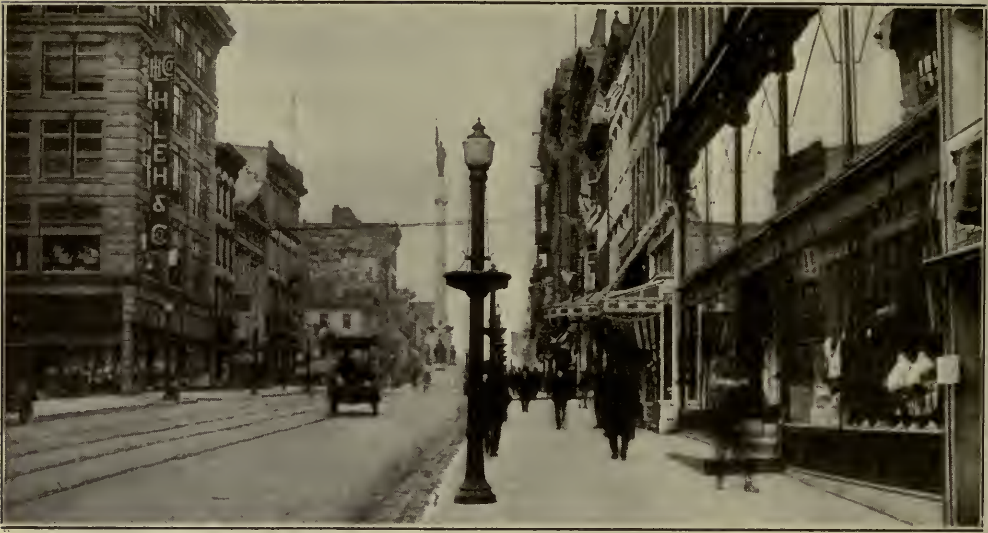
Rock crushers which may be operated by belt power from tractors are made in various forms and sizes. The principal parts, such as the main frame, crushing levers and removable jaws, are made of open-hearth steel castings of the highest grade. The crusher plates are made of special chilled iron to resist the most severe wear. The die cast babbitt bearings are removable, because the duty is so severe with these machines that this feature is necessary.

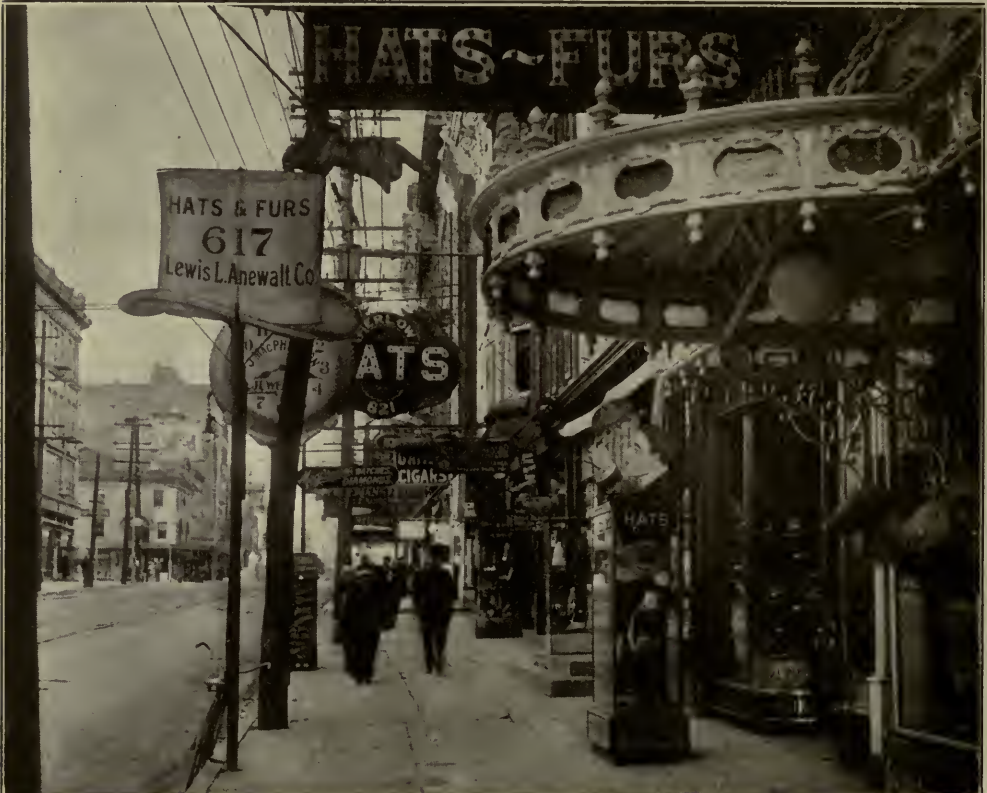
One make of crusher equipped with elevator and screen, having a capacity of 10 to 15 tons of crushed rock per hour, requires 20 horse-power for operation. Another with 15 to 25 tons capacity requires 30 horse-power. These horse-powers are well within the capacity of most of the tractors owned and operated by cities and counties throughout this country, so that, reviewing the situation, the tractor is a machine which is most adaptable to all phases of road work, and one which must be seriously considered by officials as an economical investment.

Irrigating Earth Roads

The natural earth roads in the Imperial Valley in southern California become very dusty in the dry season and very heavy in the wet season if subjected to heavy or fast traffic. During the past few years a practice has grown up in the valley of irrigating the roads. For this purpose the road is laid out in sufficient width for two separate and distinct driveways with a ridge of earth between. Instead of crowning the road as in a humid country the surface is made to slope slightly toward the center and is slightly below the surface of the irrigation ditches which usually parallel the road on both sides. About every two weeks during the dry season one side of the road is irrigated. When the surface begins to dry it is dragged. During this process the other side of the road is being used by traffic. As soon as the irrigated section is dried out sufficiently, traffic is turned on and the other side of the road is then irrigated. This method of maintenance produces a comparatively hard and dustless surface and has proved very satisfactory. The roads are usually planted on both sides with poplars, cottonwood, and eucalyptus and are very attractive.

Allentown Civilizes Its Streets





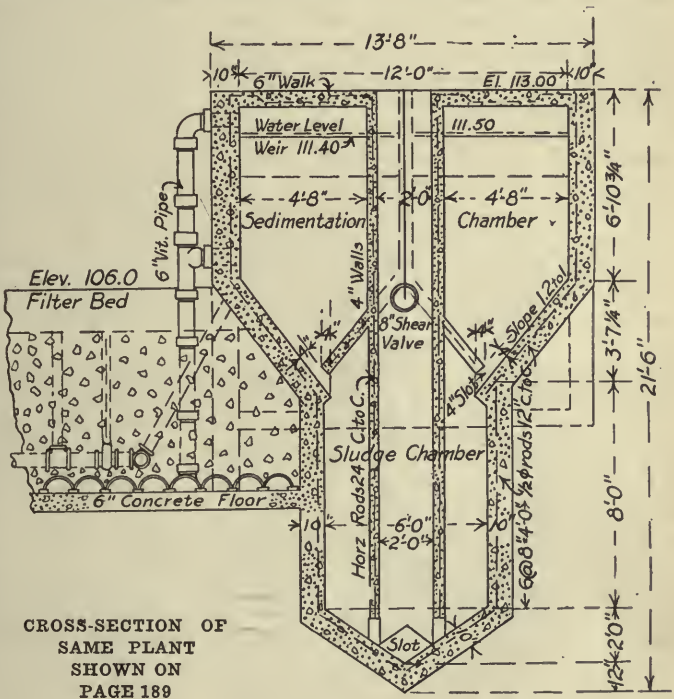
Photographs courtesy of Frank Koester, Consulting Engineer, New York

THE UPPER PICTURE SHOWS A VERY WORTH-WHILE STREET CLEAN-UP WHICH ALLENTOWN, PA., ACHIEVED BY THE REMOVAL OF OVERHEAD WIRES AS WELL AS THE OBJECTIONABLE ADVERTISING SIGNS SHOWN IN THE LOWER ILLUSTRATION

The History and Operation of the Kirdorthoff Tank—A Modified Imhoff Tank

By W. G. Kirchoffer
Sanitary and Hydraulic Engineer, Madison, Wis.

IMHOFF tanks, or two-story tanks, as they are sometimes called, became very popular as a means for the preliminary treatment of raw sewage about ten years ago. The writer's first Imhoff tanks for municipalities were installed at Elkhorn, Waupun and Whitewater, Wis. In all these installations concrete covers were used, as the city officials were opposed to open tanks and did not want to go to the expense of housing them. All the designs were based on illustrations and data given in the engineering journals and on Dr. Imhoff's American representative's catalogs.



CROSS-SECTION OF SAME PLANT SHOWN ON PAGE 189

Several plants were completed from the writer's plans before any trouble was encountered in operation. Detailed instructions were given to the operators of each tank as to the method of employ in drawing off sludge and scum, cleaning the sludge bed and other work. Trouble was first noted at the city of Waupun, where it was found next to impossible to get any sludge to pass off through the sludge pipe onto the sludge bed. Black putrescible liquid would come, but nothing else. After several attempts, the city officials became disheartened and discontinued the work. In the next few designs the writer attempted to correct this difficulty by leaving off the concrete cover and making the sludge pipe larger in diameter, straight, and as short as possible. Tanks were constructed at Mt. Horeb, Monticello, Denmark, and Waukesha, Wis., incorporating the above suggestions. The difficulties, however, still continued. Sludge would persist in accumulating on the surface of the upper chamber, with little or none coming out of the sludge pipe. If the period between drawing off the sludge was several months, the pipe would appear to be clogged.

At Waukesha, the difficulty was somewhat remedied by skimming the scum off every two weeks and pumping the black liquid sludge from the lower story each month. The effluents from all these plants was never very clear; it was always of a milky color and would soon become putrescible if allowed to accumulate along the banks of the streams into which they discharged. At the Southern Home for Feeble-Minded, Union Grove, Wis., the design was again modified by using a sludge well or chimney which extended from the bottom of the tank to the surface and from which a 10-inch horizontal sludge pipe was laid to the sludge bed. The plant was slow in being constructed, as convict labor was used, so in the meantime other experiences dictated changes in construction. The city of Ripon has had a sewage treatment plant for about 20 years, consisting of a coarse horizontal screen located over a small detritus pit, and three sand filters of about one acre in total area. The average daily flow was estimated at 345,000 gallons. This plant has given fairly good results for many years, but in the last few years the capacity was not sufficient. The sewage at Ripon is a typical domestic sewage with a small amount of woolen mill waste and creamery waste.

In order to increase the capacity of the filters, the Imhoff tank was constructed to remove the greater percentage of settleable solids. This decision was made in spite of the fact that the difficulties had been encountered in the operation of earlier Imhoff tanks. It was appreciated, however, that the principle of the Imhoff tank was correct and that the difficulties lay principally in the manner of construction and possibly in some neglect on the part of operators.

This plant was designed along somewhat unique lines. To avoid the somewhat complicated construction necessary to reverse the flow periodically, the sewage was delivered to the tank at the middle of one side of the tank by means of a large shallow trough with a narrow slot in the bottom. The flow in the upper chamber was to take place in both directions around the tank and pass from the tank on the opposite side in a similar trough. The tank was provided with two sludge wells, and two pipes and one gas vent. This design gave a relatively large surface to the upper chamber with a comparatively small space above the sludge chamber, as was common in the earlier designs. The plant was put in operation in the early part of December, 1918, and one attempt was made to draw off the sludge before cold weather set in. This was fairly successful from the standpoint of operation, but, of course, the sludge was not thoroughly digested at that time.

A sectional wood cover was placed over the tank and it was allowed to operate without interruption until about April 1, when the covers were removed and an inspection was made. It was found that there was sludge and scum on the surface of the upper tank to a depth of 3 feet or more. Sludge had also risen into the sludge well and gas vent to an undetermined depth. An attempt was made to draw off sludge from the lower chamber, but there was no appreciable flow, except the black liquid which had been found in other tanks. In a day or so the gas vent began to foam and run over into the upper story. The operator then attempted to clean the tank and took off 976 wheelbarrows full of sludge from the surface of the upper story. The filter beds were not taking the effluent, but were clogged badly, and when allowed to dry out, a thick, leathery deposit was found on the surface of the beds. The writer made an inspection of the plant, and in spite of the large quantities of sludge which had been removed, there still remained 12 to 18 inches of floating sludge on the surface of the upper chamber and in the gas vent. In the upper part of the lower story, the sludge was 16 feet or more thick. Thus it seemed that all the remedies applied had failed.

In the winter of 1917-18, the writer constructed a sewage treatment plant for his winter home in Florida. This tank was designed similar to an Imhoff tank, except that the raw sewage was discharged into the lower story of the tank, giving excellent results. The effluent was clear and readily absorbed in the underground filter which had been provided.

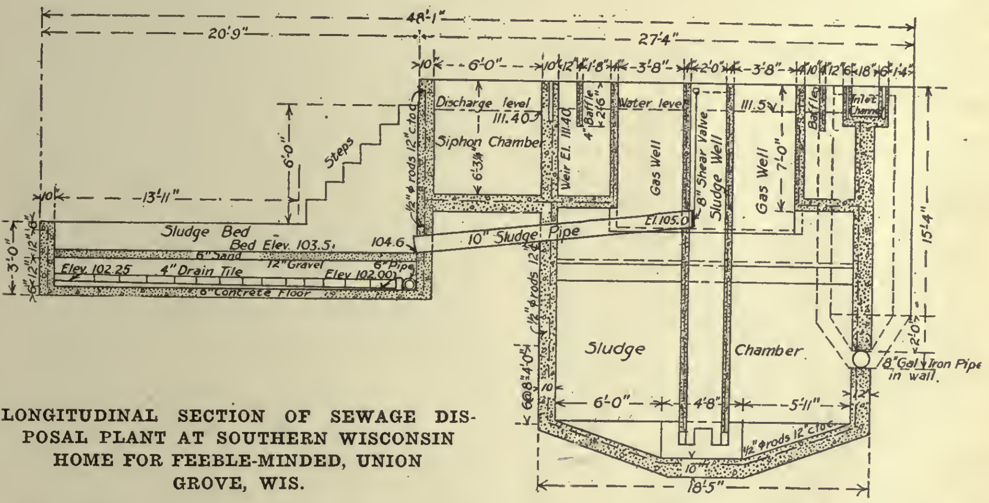
Immediately following this successful experiment, the design of the tank at the Southern Wisconsin Home for the Feeble-Minded was modified so as to direct the raw sewage into the lower story or sludge chamber. A cross-wall was placed in this chamber so that the flow had to take place upward through the slots of the first half of the lower chamber into the upper chamber, thence longitudinally through the upper chamber to the outlet. Any settleable solids brought up with the effluent could settle out and slide down into the second compartment of the sludge chamber. The tank, after being in operation for about three months, was inspected. The effluent was found to be clear but with a very slight odor, with no scum on the upper story or in the gas vent. The sludge valve was opened and a small quantity of sludge came freely, followed by black water. This plant has continued to give good results ever since it was started.

A similar tank has been constructed and recently put in operation for the village of Union Grove near-by. Returning to the reconsideration of the troubles at Ripon, it was impossible to reconstruct this tank so as to make it like the one at the Southern Wisconsin Home without considerable delay and expense. Therefore the City Engineer was instructed to close the slots in the bottom of the inlet trough and cut an opening so as to allow the raw sewage to enter the gas vent. This he did very quickly, and in three or four days the sludge in the gas vent and over the surface of the upper story began to disappear. The gas vent, although converted into an inlet, still acted as a gas vent, and to a greater degree than with the former method of operation.

The sand filters began to show signs of working more freely, and inside of two weeks the sludge at the top of the tank was reduced to a layer 3 or 4 inches thick. On opening the sludge valves, large quantities of sludge were discharged onto the bed. This dried quite readily and was not objectionable to handle. The leather-like mat on the sand filter did not form and the filters operated better than they had on either fresh or Imhoff sewage.

These experiences have shown that it is possible to digest the sludge very readily by discharging the raw sewage into the sludge chamber and that the foaming of the gas vent can be prevented. The writer believes that for very fresh sewage, such as has been encountered in a number of installations in Wisconsin, the principles involved in this modified Imhoff tank better solve the problem than the standard Imhoff tank.

This tank is really a modified combination of septic, Imhoff and Dortmund tanks.



LONGITUDINAL SECTION OF SEWAGE DISPOSAL PLANT AT SOUTHERN WISCONSIN HOME FOR FEEBLE-MINDED, UNION GROVE, WIS.

To distinguish it from other tanks and to avoid explanations and descriptions in speaking of it, the writer has decided to call it the "Kirdorthoff" tank, which name is a coalescence of the inventor's name, together with the names Dortmund and Imhoff.

Kirdorthoff tanks are to be constructed this season for the Industrial Home for Women, Taycheedah, Wis., at the villages of Markesan and Stratford, and at the city of Viroqua, Wis., where two large plants will be built. The old Imhoff tank at Mt. Horeb, Wis., will be converted.

The 1921 Efficiency Exhibition in London, England

Efficient methods of education, transportation, fire and police protection, etc., are to be displayed at the **Daily Mail** Efficiency Exhibition to be held at Olympia, London, February 10 to 26, 1921. American societies and manufacturers interested should communicate with the Organizing Secretary, **Daily Mail** Efficiency Exhibition, 130 Fleet Street, E. C. 4, London, England.

A Municipal Chimney Sweep

By Joseph McBeth

Inspector, Fire Prevention Bureau, St. Joseph, Mo.

WITHOUT doubt one of the well-known causes of destruction of property by fire is the defective flue, especially through sparks from the chimney igniting the wooden roof. The destructive spark is born of the unnecessary accumulation of soot in the chimney due to failure to clean the chimney at proper intervals. This hazard can be reduced to a minimum and most of the existing defects within the chimney discovered and necessary repairs promptly secured, if an ordinance creating the office of Municipal Chimney Sweep is enacted.

The city of St. Joseph, Mo., was probably the first city in the country to pass an ordinance creating this office. The Municipal Chimney Sweep works in conjunction with the Fire Prevention Bureau, and within the last year it has not been necessary to serve a warrant to compel anybody to clean a chimney or make repairs, for after once being warned, house owners were glad to take care of the work, as the ordinance includes a penalty for non-compliance.

The Municipal Chimney Sweep of St. Joseph reported that in 1917 2,700 flues were cleaned and 800 defective flues repaired. In 1918 there were 1,500 flues and furnaces cleaned, 140 defective flues found, and 95 repaired. The report for 1919 shows 956 flues cleaned, 122 defective flues discovered, and 80 repaired.

A comparison of the 1918 and 1919 record of flue fires in St. Joseph is interesting. In 1918 there were 95 flues which burned out. Sparks from flues caused 80 fires, and defective flues, 36. The report for 1919 shows a reduction to 75 in the number of flues which burned out, fires caused by sparks, 74, and defective flues discovered, 16. All of these sparks from defective flues caused fire department runs. In some cases the flues burned out with no loss, and in others there was a small loss. It is expected that this year there will be a still further decrease in the fire hazard from flues, because of the rigid inspection and cleaning.

A complete copy of the ordinance which has caused so much satisfaction in St. Joseph is reproduced herewith:

Section 112. Office of Chimney Sweep created:—There is hereby created the office of chimney sweep.

Section 113. Appointment—Term of Office—Bond:—At the first stated session of the common council every two years, it shall be the duty of the mayor to appoint, by and with the advice and consent of the common council, some suitable person to fill the office of chimney sweep, who shall hold his office for the term of two years, and until his successor is appointed and qualified. Said chimney sweep shall, before entering upon his duties as such officer, execute a bond to the city of St. Joseph, with surety to be approved by the comptroller, in the penal sum of one hundred dollars, conditioned for the faithful performance of his duties as prescribed in this ordinance, or as may hereafter be defined by ordinance.

Section 114. Duties—Compensation:—It shall be the duty of the chimney sweep to sweep and clean in a faithful manner, once in each year, all chimneys within the limits of the city which have been in use at least six months prior to the date of such cleaning, and he shall be allowed to his own use for said cleaning and removing from the premises the soot, dirt, or other matter taken out of said chimneys, the following rates, to be paid by the owner of the building, viz.: for cleaning each chimney as aforesaid, in a one-story house, the sum of twenty-five cents; for cleaning each chimney, as aforesaid, in a two-story house, the sum of fifty cents; for cleaning each chimney, as aforesaid, in a three-story house, the sum of seventy-five cents; for cleaning each chimney, as aforesaid, in a four-story house, the sum of one dollar, and twenty-five cents for each additional story.

Section 115. Defective Flues to be Repaired:—It shall be the duty of the chimney sweep, wherever he shall have knowledge of a defective flue in any building in this city, to report the same, without delay, to the superintendent of buildings; and the said superintendent of buildings is hereby authorized and required to notify, in writing, the owner of such building of the existence of such flue, and to have the same repaired or remedied without delay; and if such owner fail or neglect to repair or remedy such defect within twenty-four hours after receiving such notice, he shall be liable to a fine of not less than twenty dollars or more than one hundred dollars, and to a like fine for each and every day the same shall remain unrepaired.

Section 116. Chimneys to be Cleaned:—It is hereby made the duty of the owner or occupant of any building within the limits of the city to have the chimneys and flues of any such building swept, cleaned and the soot, dirt and other matter taken out of said chimneys and flues, and removed from the premises by the chimney sweep at least once in each year; any owner or occupant of a building who shall refuse or fail to have the chimneys and flues of such building cleaned by the chimney sweep, as required of him in section one hundred and fifteen of this ordinance, shall be deemed guilty of a misdemeanor, and upon conviction shall be subject to a fine of not less than five dollars nor more than ten dollars.

Section 117. Chimney Sweep to Have License:—No person shall carry on the business of chimney sweep without first taking out and having a license therefor. The charge for such license shall be fifty dollars per annum, and no license shall be issued for a less time than one year. Any person violating the provision of this section shall be deemed guilty of a misdemeanor and upon conviction shall be punished with a fine of not less than fifty dollars and not more than one hundred dollars.

Following is copy of notice served to the agent, owner or occupant of building, on the reverse side of which is printed Section 115 of the ordinance:

[*See form at top of next page*]

STUB RETAINED BY OFFICER

.... 19.....

Notified

....

To clean and repair flues.

....

....

Within..................hours.

....

Officer.

NOTICE TO CLEAN AND REPAIR FLUES

St. Joseph, Mo.............19....

Mr...........................Agent.
Owner.
Occupant.

You are hereby notified to clean and repair chimney........... at.................... within................hours from the service of this notice. Unless you comply with the requirements of this notice and Ordinance No. 618 within the time specified you will be prosecuted under the provision of said ordinance.

............................Officer.

FLUE-CLEANING NOTICE USED IN ST. JOSEPH, MO.

Highway Construction Cost Data in Various States

A Tabulation Worked Out by Nebraska Proves of Value in Comparing Costs

THE State Highway Department of Nebraska sent out a questionnaire last spring to all the other states, asking for prices on items concerning road construction, with the idea that a compilation of the data would give some particularly valuable information with regard to the trend of prices on various kinds of road work in different states. The answers, however, were not quite as complete as expected and represented conditions which were too much at variance. It is believed, however, the following data will be of considerable interest and value to engineers in highway construction throughout the country:

COLORADO

Earth excavation	$0.285—$1.35 per cubic yard
Concrete paving	2.59 — 3.17 per square yard
18-inch corrugated pipe	3.75 — 4.10 per foot in place
No prices on other classes of materials.	

ILLINOIS

Earth excavation	$ .80 per cubic yard
Concrete	1.80 per square yard, excluding cement
Brick—on concrete base	3.39 per square yard, excluding cement

IOWA

Earth excavation	$ .66 per cubic yard (straight grading)
Earth excavation	1.10 per cubic yard (for paving)
Concrete paving	4.06 per square yard
Brick paving	5.62 per square yard
18-inch concrete pipe	1.72 per lineal foot
18-inch corrugated pipe	1.72 per lineal foot

MICHIGAN

Earth excavation	$ .70—$1.00 per cubic yard
Concrete paving	2.70— 3.80 per square yard
No bids awarded in excess of $3.05 per square yard.	
Bituminous concrete	3.60— 3.90 per square yard
No bids on 18-inch pipe. Box culverts used.	

MISSOURI

Earth excavation	$ .75
Concrete	2.75 (eight inches in depth, one course)

NEBRASKA

Earth excavation	$ .58 per cubic yard average bid prices
Reinforced concrete headwalls and box culverts	45.56 per cu. yd. in place, including back fill and reinforcement
Brick (on concrete base)	per square yard, none let
Bitulithic	per square yard, none let
Concrete pavement 7 inches thick	3.93 per square yard
18-inch corrugated pipe	2.35 per lineal foot-average in place
18-inch concrete pipe	3.06 per lineal foot-average in place

Motorization Means Economy Throughout Municipal Activities

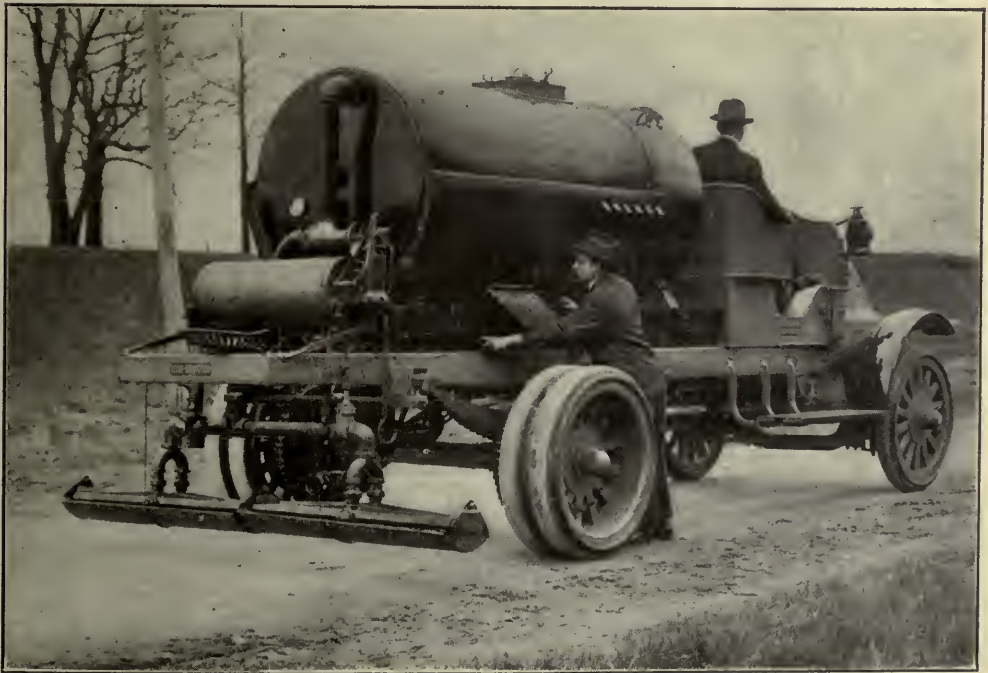
A BATTERY OF FIRE-FIGHTING APPARATUS IN LANCASTER, PA.

A FEDERAL FIRE TRUCK SUCCESSFULLY USED IN ALBANY, N. Y.

ACME TRUCK WITH CHILDS EQUIPMENT USED BY THE VILLAGE OF PENN YAN, N. Y.

The chassis has a wheel base of 245 inches, carries extension ladders, a 40-gallon chemical tank mounted in the rear of the driver's seat, 250 feet of chemical hose, besides two hand chemicals mounted on the running board, regulation siren horn and engine bell. The complete apparatus was driven from Utica to Penn Yan, N. Y., a distance of 135 miles, in 279 minutes.

POLICE PATROLS IN USE BY THE CITY OF INDIANAPOLIS, IND.
The bodies are mounted on ¾-ton chassis made by The White Company



A KELLY-SPRINGFIELD TRUCK EQUIPPED WITH KINNEY PRESSURE DISTRIBUTOR EITHER FOR SURFACING ROADS OR FOR PENETRATION CONSTRUCTION

The preservation of road surfaces by the use of bituminous binders has been standard practice ever since the advent of motor traffic. Many communities have found the construction of bituminous penetration roads an advantageous way to build new roads economically in the face of high labor costs.

Resurfacing with Sheet Asphalt Pavements

Methods of Improving Old Slag Macadam Pavement Are Economically Successful

By W. P. Cottingham
City Engineer, Gary, Ind.

WHEN plans and specifications were presented for the resurfacing of West 6th Avenue from Washington to Tyler Streets, Gary, Ind., in 1914, many interested property owners were astonished because it was suggested that a sheet asphalt pavement could safely be constructed over the old slag macadam pavement that had been allowed to go to pieces. When the Board of Public Works approved the recommendation of the Engineer and subsequently entered into a contract for the work, they were abused, and the individual members were accused on the street of having ulterior and selfish motives for their acts. However, after the street was completed and had withstood the traffic for five years, instead of condemnation, much approbation was given to the Engineering Department's plans and specifications for similarly resurfacing about four miles of the streets that had suffered most through the curtailment of the work of the maintenance department during the fall of 1918.

Immediately after the signing of the armistice, the reconstruction program for the city was mapped out, and during the winter months plans were prepared and proceedings instituted which enabled the Board of Public Works to advertise for bids and award contracts for the resurfacing work before the 1st of April, 1919.

The Successful Bid and the Specifications

The early date set for opening bids was of decided advantage to the city; many contractors who later in the season were not interested presented figures for the work, and, as usual, the additional competition from outside bidders caused the local contractors to submit bids at their lowest possible figures. One local contractor secured the several contracts on a bid of $1.38 per square yard for sheet asphalt pavement (1 inch of close binder and 1½ inches of top course) using Standard Oil Company's (N. J.) Mexican asphalt, 15 cents per square yard for regrading the old pavement to prepare it as a foundation for the pavement, and $3 per ton of stone and screenings used in the regrading work. These first contracts aggregated 40,925 square yards.

Specifications for this work included adjusting to grade, curbs, combined curb and gutters, manholes, catch-basins and gutter inlets, constructing additional drainage features and building the intersections at unpaved alleys of one-course concrete, constructing concrete headers at intersecting streets that were not hard-surfaced, regrading the old pavement surface and building it up to the desired cross-section by the addition of new material where needed and thoroughly compacting the surface to provide a firm yet rough base upon which to construct the new pavement. All work was paid for on a unit price basis, each item being included in the proposal and contract.

Progress of the Work

As soon as weather permitted, the contractor began his work of scarifying the old surfaces, and sent a gang through all the streets to rip up and loosen the surface. A grader followed the scarifying outfit, and the final trimming was done by pick and shovel. On the tar-surfaced slag macadam streets the tar surface was entirely removed from the job and a considerable amount of new stone was required to properly shape up the base. On the limestone macadam streets, a small amount of new material was worked in with the material loosened by the scarifier, to bring the surface to grade. Strict attention was given to secure proper and adequate surface drainage, but the cross-section of the street was made to conform to the existing conditions and was not brought to established template requirements. Proper and thorough compacting of the loosened material was insisted upon and soon after the contractor started laying asphalt it was evident that he could not keep his base prepared far enough in advance of his surfacing gang to prevent shut-downs at the plant.

Labor troubles gave the contractor an opportunity to get ahead with his base preparation while the asphalt workers were adjusting their difficulties, and with an increased force on the regrading he was able to finish his original contracts with very little additional delay.

New Contracts

When his first street was completed, the property owners on various other streets that needed resurfacing presented petitions to the Board of Public Works asking that their streets be given the same treatment, and further assuring the Board and the Engineer of their approval of the work in hand. Plans having been prepared in advance for all the work contemplated, proceedings were instituted at once, and before the contractor had finished his last contract of the first award he had secured the contracts for three additional streets with a total of 27,528 square yards at unit prices slightly higher than his earlier bids—$1.45 per square yard for the surface and 20 cents per yard for the regrading, and $3.75 per ton for new material.

To avoid the delays that he had encountered in the preparation of the old pavement, the contractor offered in the new work to furnish the asphaltic binder to fill all depressions and shape the street surface at his bid price for new material, provided he could be relieved of scarifying the old surface and loosening the top material. This was agreed to, and the procedure followed in preparing the base for the improvement of Tyler Street, Adams Street and Virginia Street was as follows: A strip equal in width to one-tenth of the width of the pavement was picked out by hand at the gutter line to a depth varying from 2½ inches at

PAVING SCENES FROM GARY, IND.

1. Resurfacing Tyler Street. In the foreground is shown the strip adjacent to the concrete gutter that has been picked out by hand to a depth of 2½ inches and the entire surface swept to receive the binder course, which is being laid in the background. 2. Laying the binder course on Tyler Street. 3. The first asphalt pavement laid in Gary since 1914; resurfacing 15th Avenue at Madison Street. 4. The Hetherington & Berner asphalt plant of the Gary National Construction Company which did much of the paving.

the edge of the concrete gutter to nothing at the tenth point on each side of the street, as shown in the photograph on page 195. All loosened material in this strip, and also that resulting from breaking down large protruding lumps of slag in the old surface, were carefully swept up and removed. All depressions were filled with binder and tamped firmly and the entire surface was then covered with the binder course to a minimum thickness of 1 inch and varying to the thickness required to give the desired cross-section. Wherever this thickness exceeded 3 inches it was placed in two or more layers, and each layer carefully compacted separately. This binder course was brought up to give the proper cross-section and contour for the surface. Determination was made as to the amount of extra binder used by using load tickets and computing at the end of each day the amount that had been placed on the actual yardage covered in excess of that required for the 1 inch in the pavement, and final settlement was based on this agreement. Under this method, the work was handled much more rapidly and the results obtained are much more satisfactory. There is an absence of waves in the surface in the work done under the latter method that seemed impossible to obtain where the old pavement was loosened.

More Work Planned

The approval of the property owners was expressed by their petitions for additional streets, and the approval of the Board of Public Works is given to the plans of the Engineer in its orders to him to continue the work until all the old macadam streets that have been worn out in the building of the city of Gary during the last twelve years, shall be resurfaced with asphalt. Already this year contracts have been awarded for eight streets having a total of 58,050 yards, at a price of $1.91 per square yard for the pavement, 12 cents per square yard for the regrading, and $9.25 per ton for extra binder. Reduced to a cost per front foot of property, this amounts to $4.02. Last year the cost per front foot varied from $2.98 to $3.19. In addition to the work already awarded, proceedings have been completed and bids will be received on June 14, for 40,000 square yards additional of the same kind of work.

Most of the above described work was performed by the Gary National Construction Company. The Park Board contract was awarded to the Municipal Contracting and Supply Company. The work for this reason is very evenly split between the two contractors. The City Civil Engineer is in charge of all the work, with O. B. Canaday, Assistant City Engineer, directing the operation on the ground. Isaac Van Trump, of Chicago, is retained as asphalt chemist. The same organization operated in the original construction under W. J. Fulton as City Engineer, the writer being his assistant.

PROTECTING THE SHADE TREES OF NEWTON, MASS.

The Inspection of Taximeters

By George F. Austin

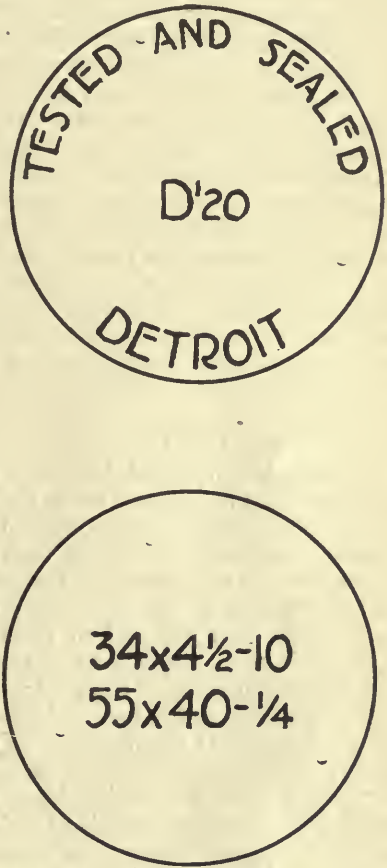
Sealer of Weights and Measures, Detroit, Mich.

AMONG the many perplexing and important problems which confront the weights and measures officials in every large city in their efforts to safeguard the public against the dishonesty and unscrupulousness of some dealers and the ignorant and careless indifference to the rights of the community exhibited by other tradesmen, the taximeter is perhaps the last to receive attention. It is, however, in nowise the least in importance, since a slight error in the mechanism of a meter will soon register a fare which would be burdensome if not prohibitive to the class of people who find it convenient to use the taxicab as a means of transportation.

Construction of the Taximeter

The taximeter is a somewhat complicated piece of mechanism consisting of a metal housing enclosing a network of shafts, gears and pinions, some of which are interchangeable in order that adjustments may be made to suit various conditions. It resembles a clock, with the exception that the taximeter, besides registering time, is required to register the number of miles traveled by the cab, the total money value for the entire trip in accordance with a stated rate of fare, including charges for baggage and time spent in waiting at the request of passengers. In no instance may a tariff be charged in excess of the rate fixed by ordinance, which, in Detroit, is 30 cents for the first one-fifth mile, and 10 cents for each additional one-fifth mile or fraction thereof.

The meter is propelled by means of a flexible wire cable connecting it to a gear on one of the front wheels of the cab, and the meter must function properly in connection with the circumference of the cab wheel propelling the meter and the ratio between the wheel and the meter head. Hence it is obvious that the degree of accuracy in recording the mileage and the fare to be collected depend in a very large degree upon the care and accuracy displayed in determining the circumference of the cab wheel in service, and from this the number of revolutions which the wheel will make in traveling a certain distance.



METHOD OF MARKING TAXIMETERS IN DETROIT, MICH., AFTER TESTING

Above: View from interior of cab. Below: View from street, indicating 34 x 4½-inch tire, a 10 to 1 gear ratio, a tariff of 55 cents for the first mile and 40 cents for each additional mile; or 25 cents for the first ¼-mile and 10 cents for each additional ¼-mile or fraction thereof

This is rendered difficult, owing to the different degrees of inflation maintained in tires in usual service; hence it becomes necessary that the number of revolutions per mile for the various sizes of tires be predetermined and arbitrarily fixed as a basis for further computation. The method used by the Department of Weights and

Measures in Detroit in arriving at this base measurement is to visit the taxicab service station, which, as a rule uses a standard size of tire for all its vehicles—for example, 34 x 4 inches. The cab wheel under investigation is marked and caused to be moved forward one complete revolution, carefully measuring the distance traveled. Repeat this operation with each cab in service, and it will be found that these measurements will vary in accordance with the degree of inflation and wear upon the tire at the time of inspection. Hence the average distance traveled of all wheels thus tested is taken as the true circumference for all wheels equipped with a 34 x 4-inch tire, which is found to be 8 feet, 8 inches, or 609 revolutions per mile. Therefore all meters intended to be used on cabs which use 34 x 4-inch tires are standardized on the basis of 609 revolutions per mile.

Method of Testing

The meters are detached from the cab and brought to the Sealer's office for inspection. They must be accompanied by information indicating the rate of fare, the ratio between the cab wheel and the meter head, and the size of the tire with which the meter has been adjusted to function. The meter is then attached to a motor-driven shaft upon which is installed an accurate revolution counter, and subjected to a test of 10 miles. If the true mileage and tariff are properly recorded, the meter is then removed from the testing block and watched through several periods of waiting time. If no errors develop, the meter is then sealed with an aluminum tag and a leaded wire seal in such a manner that the case cannot be opened without breaking the seal. The metal tag extends above the top of the meter in such a manner that the face showing the words "Tested and Sealed" and the date of inspection will be visible to the occupants of the cab, while the opposite side, indicating the size of tire used, the ratio between the wheel and the meter head, and the rate of fare, is exposed to the street for the information of the inspecting officers, whose duty it is to observe taxicabs in service on the streets and see that the meters are sealed and that they are installed upon cabs with the proper tariff and wheel measurement for which the meter has been inspected.

A tolerance of 2 per cent is allowed on meters registering slow, but no tolerance is permitted on meters registering fast, because the meters are adjusted to register the fare for each quarter-mile in advance; hence if a meter should register the fare for the second quarter-mile before the first quarter had been fully covered, there would be a possibility of a passenger's being charged for a full quarter-mile for which he had received no service.

Taximeters require almost constant supervision to prevent the drivers from tampering with them to their own advantage; for example, a broken glass on the face of the meter would not stand out as a danger signal to the average traveler, yet with the glass face broken the driver is enabled to manipulate the meter to suit his own convenience. This is only one of many ways in which the drivers may interfere with the correct operation of the taximeter.

A CITY WITH A WELL-EQUIPPED MOTOR-CYCLE CORPS IS IN A POSITION TO ADEQUATELY CONTROL THE BREAKING OF SPEED LAWS AND OTHER MUNICIPAL REGULATIONS

Municipal Finance

BONDING ACCOUNTING TAXATION

Centralized Municipal Purchasing

THE purchasing of all municipal supplies by one central office accomplishes many good purposes, and this article will deal with them in order of their value to the average municipality. Centralized purchasing eliminates waste, for the purchasing agent keeps the perpetual inventory of all departments against overstocking as well as undersupplying. Each order is signed by the auditor or controller, and finally by the mayor or manager, thus centralizing the usual scattered responsibility. Transfers from departments overstocked to those undersupplied are better accomplished through one central office.

Centralized purchasing eliminates overdrafts. Every outstanding order is on record at all times, while without such centralization thousands of dollars are in unrecorded obligations, thus preventing a true financial statement, as well as encouraging deficits toward the end of the year, to be passed on to the incoming administration. Prior to executive approval, each order is placed as an encumbrance against its particular appropriation by the auditor, like a certified check, thus making overdrafts impossible, as well as insuring funds for prompt payment.

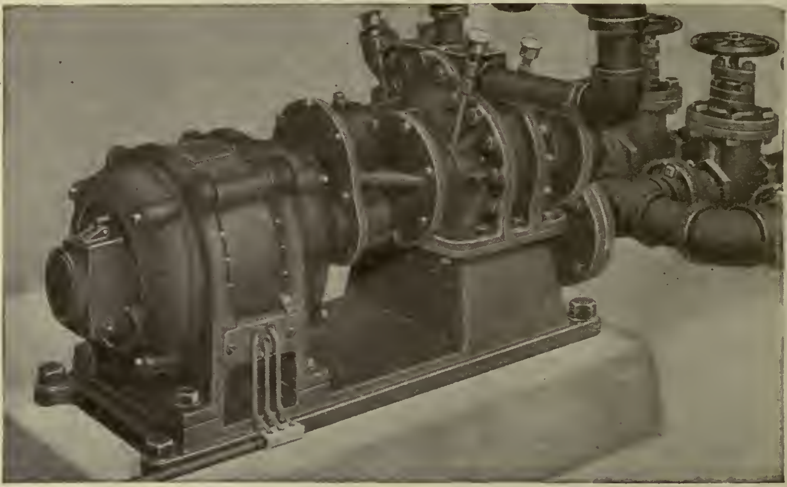
Centralized purchasing secures lowest prices. It is common knowledge, and almost any seller will admit, that centralized and combined purchases will bring about lower prices and quicker deliveries than many small purchases. There is abundant proof on record in our cities where one department is paying 33 to 100 per cent more for the same make of goods than another department, and often even when purchasing from the same dealer. The average city takes a month or more to audit and pay a bill, not only losing all cash discounts but also discouraging keen competition on quick turnovers, whereas by centralized purchasing, minus red tape, a bill can be paid in ten minutes, and special concessions of as high as 10 per cent are frequent. By a systematic record of annual requirements for all departments the purchasing agent is at all times prepared to clinch an attractive proposition, due to seasonal or market conditions, as well as arrange deliveries so as not to tie up money unnecessarily and yet assure a satisfactory supply at all times.

Centralized purchasing reduces expenditures. Knowing that his executive passes on all requisitions, a department head will not buy as much as he might if he felt there was no check upon him. Efficient purchasing and inspection assures first grade of materials, as well as full measure—otherwise the seller knows he will receive no repeat orders. The joint knowledge and experience of the department head, the purchasing agent, and the executive often leads to the securing of a better article on first cost, or a substitute which would fill the need, while if the department head had to rely on his own decision entirely, the wrong selection might more often be the result.

Centralized purchasing eliminates graft. If the purchasing agent is selected by merit, rather than by politics, he will be of the class above grafting. A real purchasing agent always has his own advancement in view, and knows that one dishonest act will wreck his entire career. Sellers are generally afraid to even suggest graft to a municipal purchasing executive for fear of losing all future chances to sell to him.

Centralized purchasing saves the taxpayer's money. The salary of the full-time purchasing agent is much less than the aggregate amount of hours wasted during a year by all the score of higher-priced officials who are forced to worry over such details in our average cities, not to mention the time lost from their real capacities. A large number of the cities now maintaining centralized purchasing departments have proved that the 2 per cent discount for payment of bills within 10 days more than offsets the salary of the official. This 2 per cent in 10 days is equivalent to 36 per cent a year, but it is an unheard of and an impossible proposition in the great majority

NORTHERN ROTARY PUMPS



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of our American cities, simply because of antiquated systems that no business concern would think of using. The trade discounts which are available but are being passed up by our cities are astonishing. In one city of under 40,000 these discounts totalled nearly $20,000 in one year; in another larger city it was $33,000, and in one of our second ten cities it was $100,000.

Besides the advantages outlined above, centralized purchasing promotes general efficiency. In these days price is often the second question, delivery being of prime importance. Here surely none can deny the advantage of centralized purchasing. A follow-up system on all outstanding orders, a tickler on tardy invoices, a knowledge of available sources of supply and, lastly, a constant touch on transportation, embargoes, etc., cannot be compared with the lack of anything resembling system under the old order. Forms play a most important part in efficient purchasing. First, there is no need of the six to ten copy sets so often seen, for by a proper system several copies can be made to work double purposes. On the requisition, quotation and invoices the original and one copy only is required; and for the order the original and three copies will answer every need that can arise. The forms for order, supply and quotation records, requisition index, etc., can all be accommodated on 4 by 6-inch cards. Not once in ninety times do we find the need of more than ten double spaces on an order sheet, yet we find cities still wasting money on large and unwieldy order forms. For filing purposes especially, all forms should be of uniform size but of varying colors. Half letter size will be found to work best for all purposes, and just one example need be cited—the fact that several thousand invoices of that size can be vertically filed in a single small drawer and always in immediate reach, while the cities still backing up vouchers of all sizes from 2-inch to legal cap will soon have to use step-ladders to do their filing.

C. A. BINGHAM,
City Manager, Watertown, N. Y.

The Continuation of the River Front Improvement at Albany

By Frank R. Lanagan
City Engineer, Albany, N. Y.

THE improvement of the river front of the city of Albany has embraced many separate but related projects, all of which were practically completed before the war, except six short blocks from the Albany end of the approach to the Hudson Bridge northerly to Madison Avenue. The Hudson Bridge, spanning the Hudson River between Albany and Rensselaer, is the connecting link between Boston and New York and places north and west of Albany. The thousands of automobiles which come to and go through Albany use this main connecting artery of travel, and it is important that they should not have their good impressions of Albany impaired by the contiguous unimproved portion of the river front.

The improvements authorized and contemplated on the part of the city consist in the acquirement of all the property between Broadway and the river, together with all dock and wharfage rights, development of park and recreational areas on the property so acquired, construction of dock walls, platforms and any needed superstructures, extension and paving of Quay Street as a marginal street along the river, and the widening, paving and general improvement of Broadway.

The direct route for automobilists from the bridge approach to the center of the city is through Broadway, and as the present block pavement to Madison Avenue was laid fifty-two years ago, its condition naturally reflects its age. The repaving of this section of Broadway would have been undertaken in connection with the section north of Madison Avenue which was widened and improved in 1916 had it not been that conditions then mitigated against a proper improvement. These conditions are now, through the joint endeavors of the

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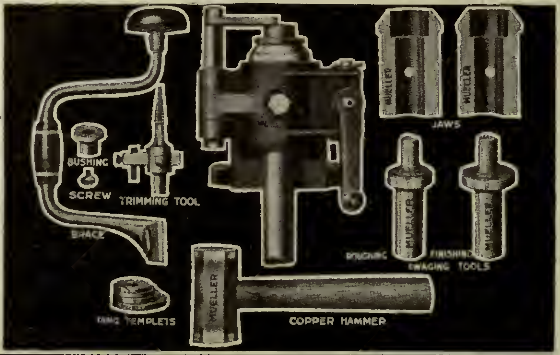

city officials and the Chamber of Commerce, about to be overcome.

The Bridge Approach

The most bothersome condition is the approach to the Albany end of the Hudson Bridge. It is narrow, the grade is steep, the planked roadway is slippery in wet weather, the turn into Broadway is a right-angle turn with an obstructed view, and the overhang of the trolley cars in making the turn takes up practically the whole roadway. The same conditions exist on the Rensselaer approach. Since its construction the bridge and its approaches have been privately owned, and tolls have been collected from pedestrians and vehicles up to 1919, when, because of its being a connecting link on an important through route in the state highway system, the state of New York acquired title to the bridge and made it free. Under private ownership the city could not secure from the bridge owners the necessary coöperation in their improvement of the approach, to dovetail it with the city's widening and repaving of Broadway. Under state ownership, however, coöperation has been secured through a bill passed by the Legislature and approved by the Governor, authorizing and appropriating funds for both the Albany and the Rensselaer approaches.

The State Engineer and the City Engineer have jointly agreed on the plans and together have overcome all the objections to the present conditions at the Albany approach. The city will raise the grade of Broadway to reduce the grade of the approach and will give such land to the state as may be needed to the north of the approach to widen the approach and make a rounded and easy turn into Broadway in the direction of greatest travel. The building which now dangerously obstructs the view will be acquired by the city and razed. The street railway tracks will be laid on a large radius, trolley cars and vehicles will be able to pass each other, and there can be a free movement of traffic in each direction.

Under an agreement made in 1913 between the city and the Delaware and Hudson Company, the railroad is to elevate its through-tracks from the bridge approach northerly. This will necessitate a retaining wall along the right of way of the Delaware and Hudson Company on the west side of Broadway. To coöperate with the city and to avoid the future necessity of taking up any portion of the new pavement, the railroad company has already started the work of driving piles and putting in the foundation of the wall. The street elevation of the concrete wall will be so paneled and finished that the appearance will be pleasing to the sight and in harmony with the other structures along the river front and especially with the retaining walls to be constructed by the state for the new and widened bridge approach.

The widening and improvement of Broadway and of the bridge approach is more urgently needed now than the other work contemplated for the extension of the river front improvement, and it is expected that much can be accomplished this year.

Park Improvements

The city has already acquired title to about seventy-five per cent of the property between Broadway and the river, together with the dock and wharfage rights along the river, and the remainder is now going through condemnation. A portion of this property along Broadway will be used to widen Broadway from 55 feet to 76 feet, a portion to widen and extend Quay Street as a marginal street along the river, and the remainder will be developed, for the present at least, into park and recreational areas. In connection with studies now being made of the industrial possibilities of the southern section of the city, it may be found wiser eventually to use this property, now intended to be developed into a park and recreational area, for industrial or commercial purposes because of its proximity to water and rail transportation. Thus the park development planned for the present is a modest one until the future use of the property can be determined.

Riverside Park, created in 1903, occupies the middle of the larger area now being acquired. The concrete retaining walls enclosing it make the general level of Riverside Park higher than the adjacent streets, and because of the expense of similarly developing the areas on either side they will be treated as separate units, the one unit adjacent to the bridge approach to be set aside as a children's playground. It is intended to erect a pavilion, construct a wading pool,

Waterbound macadam in Saugatuck Township, Michigan, treated with "Tarvia-B" in 1917, 1918 and 1919.

West Michigan Pike, near Douglas, Mich. Waterbound macadam treated with "Tarvia-B" in 1917, 1918 and 1919.

In oval: Waterbound macadam road near So. Haven, Mich., patched "Tarvia-KP", treated "Tarvia-B" 1918-19.

West Michigan Pike, Van Buren County, Michigan. Waterbound macadam roadway treated with "Tarvia-B" in 1918 and 1919. Part of a 15 mile stretch of Tarviated roadway.

Tarvia will save the country's roads—

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One road, for instance, was so bad that the Township Board decided the only thing to be done was to rebuild it at the cost of a new road, but after seeing results obtained on other roads, decided to patch and treat with "Tarvia-B" and stone chips, and—"*the road is better than when new*," they say.

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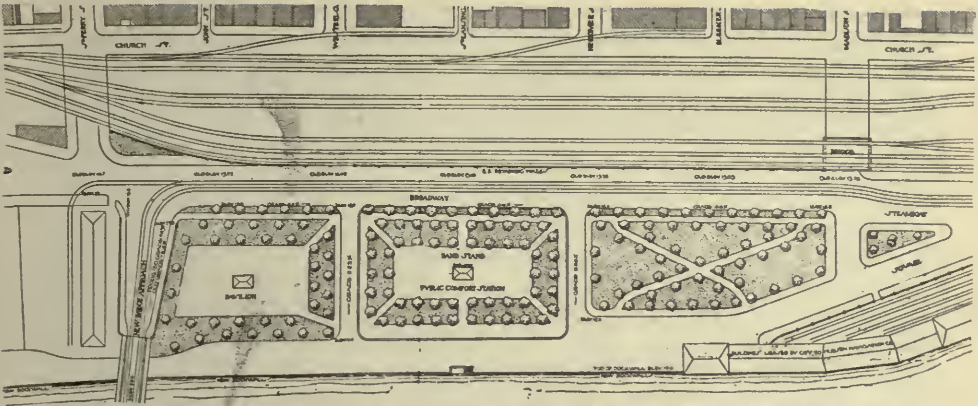

DESIGN FOR CONTINUATION OF RIVER FRONT IMPROVEMENT AT ALBANY, N. Y.

and furnish it with sand-boxes and suitable playground apparatus. The present Riverside Park unit is to be set aside as a sitting-down park, and in the center a band-stand with a public comfort station underneath is to be constructed. The remaining plot or area to the north is to be used simply as a passing-through park.

Dock Facilities

All the dock and wharfage rights, together with the concrete dock walls and terminal buildings along the present improved river front, are owned by the city and leased to the various established steamboat companies, and certain sections are available for the use of transient vessels. The policy of public ownership of the docks is to be maintained in the present continuation of the river front improvement. The concrete dock wall to be constructed southerly along that portion of the river front now being acquired will be similar in type to those already constructed, except, on account of the proximity of the bridge, it is probable that it will be used by comparatively small vessels, and consequently the elevation of the top of the dock will be placed at a lower level to better accommodate the smaller boats. There is no established steamboat line not already provided with a berth, and this stretch of dock will be available for transient vessels, for instance, boats loaded with building materials of various kinds. Such freight will require, at the most, only covered sheds for over-night storage. Most of the freight will be loaded or unloaded directly from truck to boat or vice versa, and for this reason the Quay Street pavement will be constructed to the dock wall, and freight platforms will be omitted.

LOOKING SOUTH ON BROADWAY, ALBANY, A 55-FOOT STREET, WHICH IS TO BE WIDENED TO 76 FEET, WITH A 56-FOOT PAVED WAY OF DRESSED GRANITE BLOCKS

The property at the left, between Broadway and the Hudson River, is being acquired by the city to be converted into a riverside park

Flesh and Blood, just like us

WHEN the prison fire gong sounded through the cheerless silences, the young guard pictured those long rows of cells alive with fear—blind fear that made men helplessly beat their fists raw against the iron bars.

The thought flashed through his mind "after all they are flesh and blood just like me."

"If I were the warden," he thought, "I'd let them out. It isn't fair not to give them a chance."

Just as he reached the nearest fire station shrieks came down to him from the barred windows above. As other watchmen were already unreeling the hose he raced on by towards the old East Wing where the danger seemed greatest.

The warden called him back—"Never mind that part, Anderson. Take this hose, and use it, boy. Don't let the blaze reach the stairway, or we'll have to open the cells."

He did as ordered but all the time he kept looking towards the East Wing.

Just as he feared, the old timbers caught at last. He heard them crackling, saw the flames leap and then as suddenly die down again.

"It's the sprinklers," cried the warden, "I knew we could count on them. We should have had them everywhere."

Last November, two great prisons were swept by fire. Others will burn this year. Now and then the barred and bolted sleeping quarters burn, and lives are cruelly sacrificed. *Are you waiting for that to happen, before insuring their safety?*

All modern thought and many organizations are working to make men and women prisoners into good American Citizens. It's a big job—but it's succeeding mightily. The best officials want the best for their inmates. They know that Grinnell Automatic Sprinklers give adequate protection to all parts of buildings. Won't you help them?

Read—*"Fire Tragedies and Their Remedy"*

Write us for *"Fire Tragedies and Their Remedy"* and learn the truth. How about the penal institutions of *YOUR* town? Write us and ask about them. Address, Grinnell Company, Inc., 283 West Exchange Street, Providence, R. I.

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EXECUTIVE OFFICES: INCORPORATED PROVIDENCE, R. I.

Complete Engineering and Construction Service on Automatic Sprinklers.
Industrial Piping, Heating and Power Equipments. Fittings, Pipe, Valves.

GRINNELL AUTOMATIC SPRINKLER SYSTEM—*When the fire starts, the water starts.*

Water-Works Extensions and Improvements

A Plan of Action Outlined for Municipalities and Engineers

By P. H. Norcross
Of Norcross & Keis, Consulting Engineers, Atlanta, Ga.

IN the design of all water utilities, it is axiomatic that the first consideration should be the quality of the supply. Next, it should be ample as to quantity and pressure to meet all reasonable requirements for fire protection and domestic and industrial service.

The designing engineer of a public water-works begins by making certain basic assumptions and preliminary figures, as a set-up or forecast for the proposed work, ramifying and enlarging the plan as the problem grows, under careful study, "until it is submitted to the municipality as a preliminary plan." The original, or preliminary plans, are further changed and modified to meet local conditions, and by the time construction work is started it has been emasculated to such a degree that it ofttimes bears only slight resemblance to the preliminary. During construction other changes are necessitated for the sake of economy, and by unforeseen conditions. To furnish fire protection, it is of course important to provide emergency or duplicate equipment and mains of larger diameter than would be required for domestic and industrial consumption. For the protection of the fire insurance companies, as well as the public, the insurance companies have established the National Board of Fire Underwriters and other similar bodies, which maintain large engineering organizations, one of whose functions is to coöperate with the municipalities in the planning of their water-supply utilities, and assist them in the design, arrangement and construction of water plants, specifically as applies to fire protection. This necessarily suggests that in the design of all public water-supplies, either privately or municipally owned, cooperation and harmony with the underwriters, who furnish expert service and advice to the designing engineer and the city without charge and thus provide invaluable assistance in design and construction, is essential.

It is difficult to determine the exact proportion of the cost of a water-works property, as applicable to domestic and industrial service on the one hand and fire protection on the other. Some authorities have arbitrarily apportioned these costs, in proportion to the investment required for each service, as follows:

30 to 35 per cent chargeable to city fire protection
65 to 70 per cent chargeable to industrial and domestic service

Studies of Water-Supply Problems

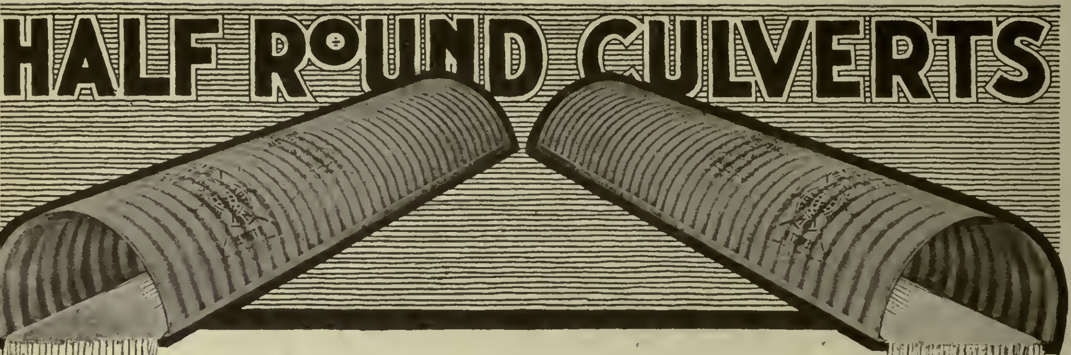
In the study of the average water-supply problem the order or procedure in regard to its design is usually as follows:

1. The selection of the source of supply
2. Determination of method of bringing it to the city
3. The planning of pumping stations, purification systems and reservoirs
4. Distribution

After having designed and constructed the water-works system in accordance with this general outline, the next and most important step is to convert the property into a going concern by connecting it with the consumer. After construction and before being operated, the property may be termed only the "barebones" or "skeleton" of the plant. To breathe life and activity into it, it is essential that it have consumers attached, as it is only after this latter condition exists that the water-works property becomes a going entity.

The Distribution System

In planning the distribution system it is advisable to lay the distribution mains in such location as will provide easy access for potential customers, so that they may obtain water without large initial expenditures for service connections. Naturally, the wise and experienced operator will first endeavor to secure as large a revenue as is possible. This is absolutely necessary to provide sufficient income to pay fixed and



Have You Ever Stopped To Figure Out

the many advantages of half round flat bottom culvert pipe for city use? We make this type of culvert from "Genuine Open Hearth Iron" and they can be readily used when the fill is not sufficiently heavy to permit the use of the right size of round riveted pipe for the capacity needed. The bottom sections can be had in lengths of 6, 8, 10 and 12 feet, thereby giving a more rigid culvert than if the bottom were made of shorter sections. The top sections on the other hand are made in multiples of two feet. When a pipe becomes clogged it is easy to dig down and lift the two foot top section where the stoppage exists after which the top section can be replaced without the necessity of digging up the whole pipe or stopping traffic altogether.

Let us have your address so we can send further particulars.

The NEWPORT CULVERT Co.
542 West 10th Street NEWPORT, KY.

operating charges, amortize bonds, depreciation and funds for extensions and improvements, without burdensome taxation. To do this it ofttimes becomes necessary to make numerous long extensions of small service mains at minimum first cost. The customer is not always located adjacent to the distribution system nor within the city limits. The suburban demand is growing larger each year, and is brought about by two factors: first, the desire of the individual for a home near or outside the city limits, away from noise and dirt; and, second, the logical development of industrial plants in remote districts and outside the corporate limits, influenced by moderate-priced property, large enough for future extensions and under low taxation. This "outside" business has grown to such proportions in the last ten years that with many properties a proper allocation of the output would be 60 to 70 per cent for city service, and 30 to 40 per cent for outside service.

Few of our water-works systems were designed to meet such requirements. The location of pumping plants and the size and arrangement of distribution have not been forecast to meet these conditions, and with the older and less modern water properties the operator is at his wits' end to give service and maintain a proper financial balance.

In the majority of cases it has, of course, been impracticable to plan for economical future extensions and improvements, as experience has proved that because of excessive initial cost and consequent heavy fixed charges only limited construction to meet original requirements is practicable. Summarizing: the enormous increase in urban population, the gradual but expanding industrialization of the United States, and the cessation of nearly all new construction during the war, have precipitated an added burden on all public water-works properties, so that they are now strained to the breaking point to furnish supply and service and meet the ever-increasing demands.

Water-Supply and City Planning

The problem of city planning, which is receiving so much attention to-day, involves the fundamental question of water-supply. Next to air, water is the element most necessary to our existence, and the general public not only asks, but requires, that this ever-increasing demand be met. Of the various elements entering into a city plan, the water-supply system is one of those least susceptible to radical changes, because of the great expense involved and the fact that present service, both domestic and fire, must be maintained. Quoting from the *Engineering News-Record* of recent date, "a water-works becomes more complicated the larger it grows, and there is something more to the problem than the mere adding of new equipment."

There exists, therefore, a new and greater problem for the operator and the designing engineer in the study and preparation of plans for extensions and improvements. Among others are the rapid strides made in water purification and in the new types of pumping equipment. These are exemplified to a high degree in modern plants, and the operators of the older and larger plants are beginning to realize that gross incomes can be increased, operating charges decreased, and better service rendered by the installation of intelligently planned extensions and improvements.

Some of the more important elements of a water utility in which improvements have been made might be listed as follows:

1. The development of mechanical or rapid sand filtration
2. The utilization of rotary types of pumps, either electrically, steam- or oil-driven
3. Modifications in pumping plant design for the purpose of providing greater reliability of operation
4. Installation of impounding reservoirs, to facilitate purification, effected by natural agencies, such as light, air and sedimentation
5. Refinement of design of coagulating basins
6. Economic utilization of different kinds of chemicals and equipment in the treatment and softening of water
7. Unparalleled growth of the use of liquid chlorine for sterilization of water
8. Intelligent design in the location of service reservoirs, booster stations and elevated storage
9. Utilization of wood and steel, in addition to cast iron, in the manufacture of conduits and pipes
10. Development of various types and sizes of measuring and detecting devices for registering the amount of water used by different classes of consumers, thus effecting economies in the use of water for domestic and industrial purposes

Acknowledgment.—From a paper read before the Tri-State Water and Light Association of the Carolinas and Georgia, May 21, 1920.

For City Grading, Hauling, Road Making, Snow Removal

Every winter the question of snow removal is of vital importance to city officials, park commissioners, and industrial plants. The solution to the whole problem is in getting to work when the snow storm commences, and being able to clear the snow faster than it falls or drifts.

The "Caterpillar" Tractor is the one successful power method for removing snow from city streets and country highways. It meets every need for a highly effective machine capable of bucking snow drifts, ice, sleet, working fast and at a minimum cost.

The "Caterpillar" is powerful, fast and active. It works in crowded city streets, does not damage the finest road surface; instantly turns within its own length. Built to military standards it operates day and night if necessary, no matter how low the temperature.

Holt engineers have developed highly effective types of snow plows thus providing *a complete "Caterpillar" snow removal outfit.*

Investigate the "Caterpillar" at this time in preparedness against snow blockades during the winter months. Holt engineers are equipped to give thorough cooperation in all municipal snow removal and road building problems.

Our booklet *"Caterpillar" Performance* will be sent upon request.

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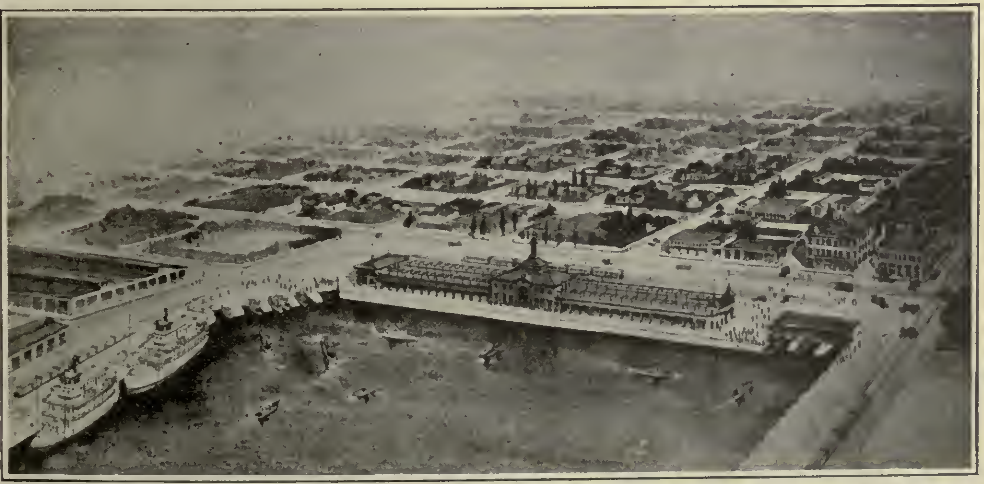
News and Ideas for Commercial and Civic Organizations

Stockton, Calif., to Have Deep-Water Harbor

Stockton, Calif.—Plans for a deep-water harbor at Stockton have been worked out by competent engineers, roughly estimated to cost $4,000,000. A complete survey of the San Joaquin River revealed the fact that but slightly more than 16 miles of dredging is necessary to provide a channel 24 feet deep from Stockton to San Francisco Bay, and to increase the width of the channel to 300 feet. Sanction for the survey was given by the Rivers and Harbors Board after a hearing at Washington, D. C., where members of the Waterway Committee of the Chamber of Commerce presented their arguments in favor of the project. At the same time they pledged the city of Stockton to bear one-half the cost of the work. Much work has already been done to straighten the channel. Fourteen cut-offs have been made in the river, four by the state and ten by the United States Government.

As the Government requires definite harbor plans when such projects are submitted, the Chamber of Commerce opened negotiations to secure the best engineer available, realizing that the value of the plan would rest largely on the authority submitting it. The Chamber finally recommended to the city an engineer extremely well qualified for the work. This engineer was subsequently employed, and prepared comprehensive plans for the improvement of the harbor. His plan provides for two turning basins, one to be 1,000 feet in width, the other approximately 1,200 feet, with a head wharf frontage of 1,000 feet. In the meantime the Chamber has succeeded in securing all the rights of way necessary for a 300-foot channel.

The Board of Army Engineers demands further information regarding the territory that will be affected by the proposed channel, particularly in regard to the movement of freight in and out of the great interior valley of California. Figures have been prepared covering some of the larger items of tonnage, but in the preliminary hearings no effort has been made to deal with the smaller items that would undoubtedly move by water were the facilities provided. The Chamber has undertaken the task of a



AN ARTIST'S DRAWING OF THE HEAD OF STOCKTON CHANNEL AS IT WILL APPEAR IF THE PLANS UNDER DISCUSSION ARE ADOPTED

Effecting a material saving

This 1800-gallon Mack constant pressure flusher and sprinkler can be readily converted into a dump truck for winter work. Continuous chassis use means municipal truck economy.

THE adaptability of the Mack direct driven pump and single engine design meets every municipal flushing requirement with materially less repair and operating cost. Their successful application to street-cleaning problems is evidenced in New York, Chicago, Detroit, Buffalo, Philadelphia, New Orleans, as well as numerous other cities.

Distinctive Mack engineering features, combined with 18 basic Mack patents, have developed the motor truck the world is talking about.

We offer two models and twenty types.

INTERNATIONAL MOTOR COMPANY
New York

"PERFORMANCE COUNTS"

freight survey of the valley and feels confident that a report of this character will prove conclusively the advisability of providing the larger channel.

The use to which the existing waterway is put is shown by government figures. Last year more than 2,000,000 tons of freight were carried on the river, representing a value of $65,000,000. More than 236,000 passengers were carried. The citizens of Stockton are firmly convinced of the value of the greater channel and stand ready to vote bonds to make it a reality. Located as it is at the lower end of the highly productive San Joaquin Valley, and served by three transcontinental railroads, the completion of the deep-water channel will give to Stockton advantages second to those of no other city in the state.

A VIEW OF STOCKTON CHANNEL, SHOWING VARIOUS TYPES OF RIVER CRAFT AT ANCHOR

GILBERT KEITLE,
Publicity Manager, Stockton Chamber of Commerce.

Erie, Pa., Restored as a Lake Port

Erie, Pa.—"Ship via Erie—Pennsylvania's Lake Port" was the slogan adopted by the Erie Board of Commerce to further the development of one of its most important features of work. Until Congressional action prohibited joint ownership and operation of railroad and lake carriers, Erie had a large lake traffic. The task of restoring lake tonnage and the reestablishment of the city as a maritime center was a duty which the Board of Commerce imposed upon itself and which it has now succeeded in accomplishing.

The congested conditions of the terminals in the cities of the central Northwest has greatly hampered the efficiency of railroad service. Since the restoration of lake traffic at the port of Erie, the cities of Duluth, Detroit and intervening points have been opened to largely extended traffic, and a new means of service has been secured.

Erie is the only lake terminal of the Pennsylvania Railroad and the only lake port of the state. Its opening to lake traffic will result in the development of maritime facilities and in the growth of the city industrially as well as in population.

H. A. DAVIDSON,
Secretary, Erie Board of Commerce.

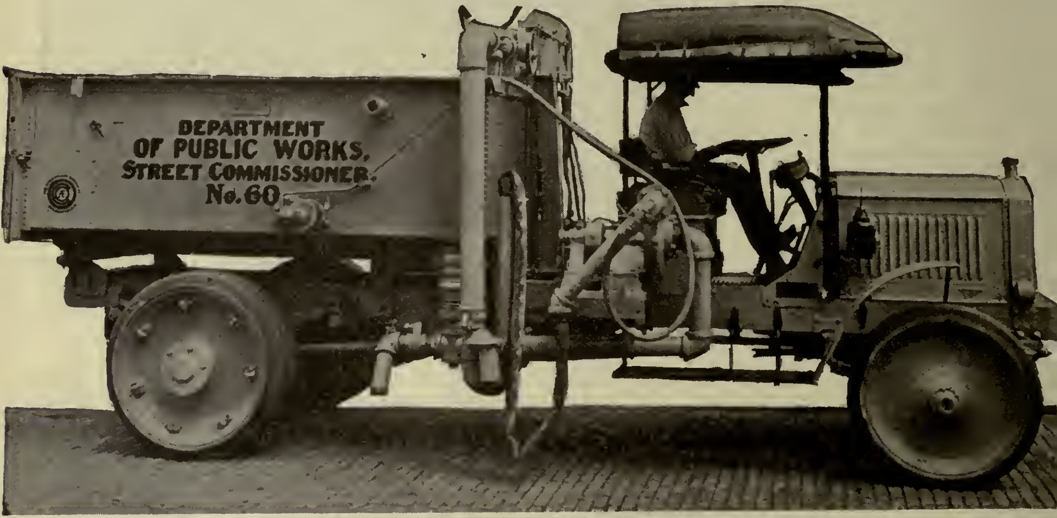
Houston's Vigilance for the Health of Her School Children

Houston, Tex.—Eternal vigilance is the price of good health as well as of liberty. The Houston public schools have found that diseases among children can be minimized through the operation of a health program calling for the vigilance of a corps of trained nurses and a city school physician.

Houston has 24,000 school children and 49 city school buildings. Each of the twelve nurses has supervision over a certain number of schools. The nurses visit the schools constantly and keep up a daily health inspection service. A child that is found to be infected with any disease is immediately sent home, and if the parents of the child are not able to secure the services of a physician, they may have the child treated at the free clinic maintained by the city school system. Any child with skin disease,

Otterson Auto-Eductor Cleans Catch Basins

Saves Time-Money-Labor



The Otterson Auto-Eductors are saving thousands of dollars yearly to the following cities now using them:—

Seattle, Wash., 1 machine
Portland, Ore., 1 machine
San Francisco, Cal., 1 machine
Chicago, Ill., 1 machine
Chicago, Ill., repeat order, 6 machines
Chicago Park Board, 1 machine
Milwaukee, Wis., 2 machines
Milwaukee, Wis., repeat order, 2 machines
Indianapolis, Ind., 1 machine
Indianapolis, Ind., repeat order, 1 machine
Louisville, Ky., 1 machine
Louisville, Ky., repeat order, 1 machine
Akron, Ohio, 1 machine
Albany, N. Y., 1 machine
Brooklyn, N. Y., 1 machine
New Bedford, Mass., 1 machine
Providence, R. I., 1 machine
Providence, R. I., repeat order, 1 machine
Richmond, Va., 1 machine
Bridgeport, Conn., 1 machine
Halifax, N. S., 1 machine

U. S. Army Camps:

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Efficient, economical and sanitary in operation. Cleans catch basins in from four to twenty minutes:

Equipment mounted on any 5-TON Chassis of suitable standard make.

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infected tonsils, defective vision, bad teeth, or other disease immediately comes under the eye of the school nurse. When the child is sent home, the nurse may visit the home and direct the treatment if the case is of a malignant type. The child is required to secure a health certificate from the city school physician before it is admitted to school again. Saturday is "vaccination day," and no child is admitted to the schools until it has been vaccinated.

The nurses give classroom talks containing practical lessons in health and hygiene. This method of teaching health has proved very effective. Houston is said to be expending more money in health work than any other city in Texas, and the citizens are satisfied that it is money well spent.

GARLAND S. BRICKEY,
General Manager, Houston Chamber of Commerce.

The Hagerstown Chamber of Commerce Has "Military Night"

Hagerstown, Md.—In order to assist in the state-wide reorganization of the Maryland National Guard, and especially to stimulate the interest of the local people in the home town company, the Hagerstown Chamber of Commerce held a Military Night recently. The first event of the evening was a banquet in honor of the Adjutant General of Maryland, Milton A. Reckord, with other National Guard officers as guests. This banquet was attended by the representative people of the community.

Following the banquet, a reception and dance were held at the local armory in order to give everyone an opportunity to meet the officers and learn more about the plans for forming a National Guard company. The Chamber of Commerce, through its directors, endorsed the reorganization of the Maryland National Guard, and assisted in the formation of a local unit, called Company B, by sending news-letters to the membership urging that each business house give its quota to the local company. The Hagerstown company enjoyed an enviable record during all the American wars. That history is something that the community is anxious to perpetuate, and through the coöperation of the Chamber of Commerce the Hagerstown company was among the first in Maryland to recruit its organization to full strength.

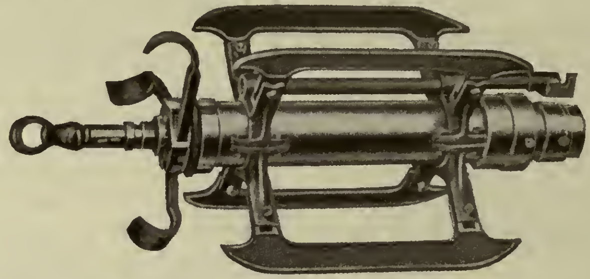
SIMMS JAMIESON,
Manager, Hagerstown Chamber of Commerce.

Frankfort Chamber Puts Life Into Local Tobacco Market

Frankfort, Ky.—Visits by groups of business men to local tobacco warehouse sales last winter were a feature of the work of the Frankfort Chamber of Commerce that proved to be highly advantageous to everybody concerned. The sales were held daily in some one of the three big Burley tobacco warehouses. Groups of business men were selected by the Secretary from the membership for these visits, and were conducted by him to the warehouse where the sale was going on.

The result of this intercourse was that the tobacco merchants were able to get better prices because of the interest which the large manufacturing buyers took in the daily sales; the growers were encouraged by the coöperation of the Frankfort business men to favor Frankfort over near-by markets; and a larger volume of business was carried on last winter by all the ware-

HAGERSTOWN'S OWN COMPANY "B"



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house companies than in former years, despite the fact that many low grades were offered, on account of the excessive dry season, which decreased the higher average desired.

When the question of assisting the local tobacco market was brought before the Directors of the Chamber of Commerce, they expressed a desire to coöperate in every way possible. The Secretary was called into service as a publicity man. He was asked to visit the sales and to keep newspaper stories going about them and the doings of the markets. This was all very well until the Secretary began to make a careful survey of the situation. This survey revealed that not over 15 per cent of the people in Frankfort had ever attended a tobacco warehouse market sale; that the newspapers had not been publishing tobacco warehouse sales news for the last two years, owing to misunderstandings existing between them and the tobacco market men; that the tobacco warehouse men were not advertising in the papers, nor coöperating at all with the publishers, largely for the foregoing reason; that not enough cordiality existed among the separate warehouse corporations, and that the merchants of Frankfort were not aware of the conditions existing between the publishers and the tobacco men, and therefore failed to understand exactly what was necessary in order to assist the local tobacco market.

The Chamber realized that before anything could be accomplished all those in town interested in the Frankfort tobacco market must be brought together and made acquainted with the true situation. Accordingly the newspaper men, the representatives of the three tobacco warehouses, and the Chamber of Commerce officers were brought together in a friendly conference.

On the evening selected, fifteen men assembled at the Chamber of Commerce office and talked the matter over. Each side presented its case as it was understood to exist. Misunderstandings were found to be the cause of most of the trouble. When each side had presented its reasons, agreements as to the future methods of procedure were entered into.

The party broke up in a pleasant frame of mind, and the future for Frankfort's tobacco warehouse market looked bright. The largest and best season closed in March. The newspapers carried large advertisements ranging from three columns wide to a full page. Outside places were canvassed and extra copies of newspapers were sent there. The tobacco men rallied around their Chamber of Commerce by subscribing to eight plural memberships each. Some individual tobacco stockholders who were especially interested took out one or more memberships, and others increased their memberships through their own private businesses. As a result of this coöperation brought about by the Chamber of Commerce, the tobacco warehouse men are paying large dividends, the newspapers are selling more advertising space, the banks are receiving more money, the farmers are selling their tobacco at home and at better prices and are trading with their local merchants, and lastly, the Chamber of Commerce has been rewarded with increased income through increased membership.

L. S. JOHNSON,
Secretary-Manager, Frankfort Chamber of Commerce.

Vicksburg Acquires Fair Grounds

VICKSBURG, MISS.—Seventy-five acres of land has been purchased by the Fair Association Committee of the Vicksburg Board of Trade for use as fair grounds and playground. The tract is in the southern section of the city, convenient to two car lines, and is traversed by a main line of the city's sewerage system. Its topography is varied and picturesque, and affords at its highest point a magnificent view of the Yazoo and Mississippi Rivers.

Following the purchase of the land, the Committee apportioned among Vickburg's business and professional men the sum of $60,000 to be used in developing the property. Practically all apportionments were accepted without question. At the close of the campaign for funds, the Mississippi-Louisiana Fair Association was formed.

The property will be used as a racecourse for horses and automobiles, as baseball and football grounds, and as a public playground. A level valley 2,000 feet in length, extending from the northern to the southern limits of the property, can at little expense be developed as a landing field for aeroplanes. Tennis, basket-ball and handball courts will also be provided. A half-mile track is now being graded, and on its completion the baseball and football fields

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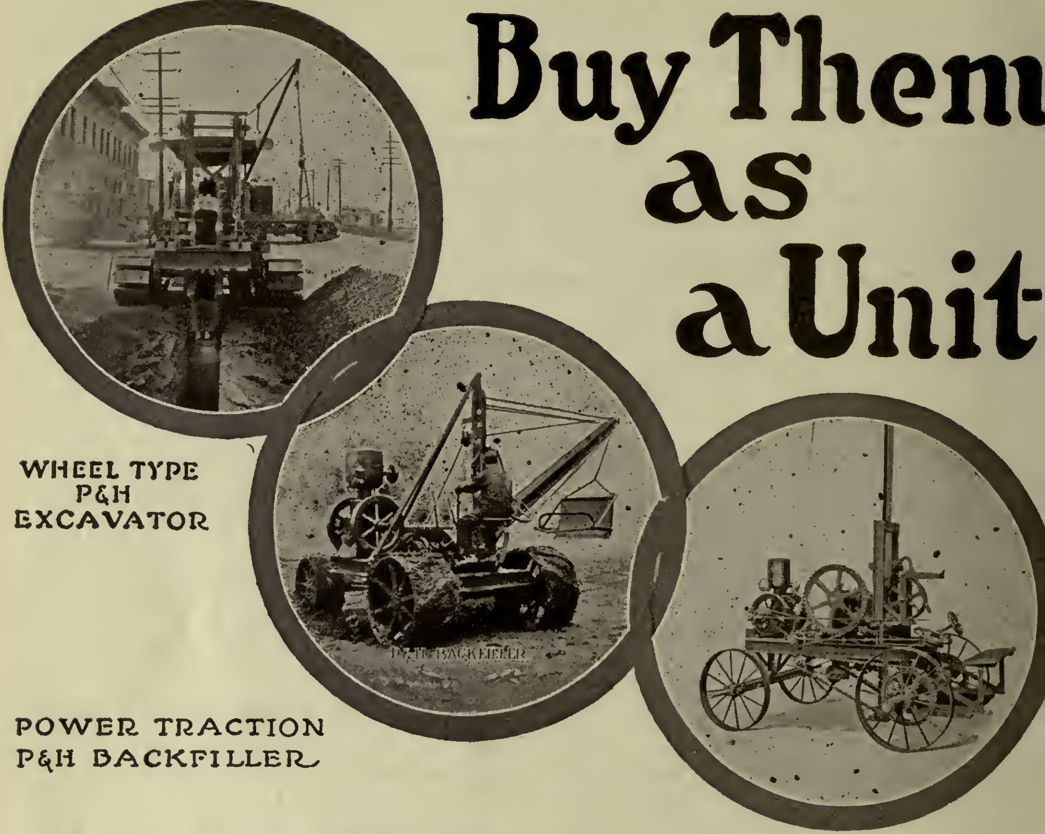

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Excavating: steady and fast with none of the irregularity and time consumption of human labor and at a cost that shows big in net savings.

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EST. 1884
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Pittock Block, Portland, Or
1125 Central Building, Lo
Angeles, Cal.
821 Monadnock Bldg., Sa
Francisco, Cal.

"You see them wherever you go, and they go wherever you see them"

**P&H — excavators —
back-fillers - tampers**

will be developed. A large grand stand, an exhibition hall, poultry buildings and stables for live stock will later be erected. The plan is to make these of permanent construction that will require small maintenance cost. Hollow tile will be used for the buildings, which, to conserve funds, will be without architectural adornment. The note of beauty will be supplied by evergreen vines which will cover the exteriors.

The grand stand, which will seat 3,000 people, will be built into the hillside from which material is being excavated for the race-track. It will be of concrete, the seats being cut into the hillside and overlaid with concrete.

A swimming pool 200 by 250 feet and ranging in depth from 0 to 8 feet will be a feature of the grounds. A ravine sloping to the center, through which flows a bold spring, affords the opportunity of constructing the pool at small expense. A sand bottom will be used.

The Association's plan contemplates the development of the grounds into a real civic center, a gathering place for all Vicksburg's people, old and young. It will be planned to provide for athletic sports, gun club "shoots," conventions and every other form of diversion in which there is local interest. Some years must elapse and a considerable sum must be added to the funds now in hand before the plan can be carried to the point of completion. Before the end of the current year, however, the property will be available for many uses by the public.

The fair grounds project supplements a playground program which the Civic League, Vicksburg's women's organization, has carried out for the pleasure of the little children of Vicksburg. Small, well-equipped playgrounds for the little folks have, through the League's efforts, been developed in every section of the city.

FRANK H. ANDREWS,
Secretary, Vicksburg Board of Trade.

Kansas City Votes $250,000 for Fire Alarm System

Kansas City, Mo.—The citizens of Kansas City recently voted bonds in the sum of $250,000 for a fire alarm system that was very badly needed. The project was supported by the Chamber of Commerce, and was carried by a large majority.

Kansas City, as pointed out by the Chamber of Commerce in its recommendation, is one of the few cities of over 25,000 population in the United States which have been depending upon the telephone for reporting fires, and several large fires were traceable to inability to reach the fire department quickly enough over the telephone. The Fire and Water Board almost immediately after the chamber's action recommended to the Mayor that steps be taken to submit to the voters the question of providing a fire alarm system. An ordinance calling for an issue of $250,000 in bonds for the purpose was drafted and submitted to the Council. The ordinance was passed by the council after a strong recommendation of the Chamber of Commerce, the Mayor and the members of the Fire and Water Board.

The sum voted will build the central fire alarm station and also install the signal system in the down-town district and in one of the principal industrial districts.

JOHN M. GUILD,
General Secretary, Kansas City Chamber of Commerce.

$3,000,000 Secured for Roads in Lawrence County

New Castle, Pa.—A good roads bond issue of $1,000,000 recently submitted to the voters of New Castle was carried by a vote of nearly five to one, said to be one of the largest majorities ever registered in the state. This is the result of a movement inaugurated by the Board of Trade about two years ago for the construction of a system of hard-surface roads throughout the county, one object of which was to connect New Castle with the centers of population outside the city in every direction.

Previously the only difficulty experienced in getting roads built was that each section demanded that the road that would serve it be built first. An extensive road-building program providing for every section of the county was finally outlined by the Good Roads Committee of the Board of Trade, and received the approval of the Directors. The County Commissioners were then petitioned to bond the county for 2 per cent, or $829,000, for roads and bridges. This action was taken by the Commissioners.

The Good Roads Committee next requested that the bond issue be increased by submitting to the voters of the county a further bond issue of $1,000,000, thus making $1,829,000 available for road building.

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C
CHICAGO

The Board of Trade then inaugurated a vigorous campaign of publicity, which was conducted at a cost of less than $500, along the following lines. Interviews with prominent citizens from all parts of the county were published in the daily newspapers every day for ten days; half-tone cuts of good roads were borrowed from an association of cement manufacturers and were used in display advertisements appearing in the daily newspapers every day for ten days; slides on the subject were shown in the moving picture theaters throughout the county; four-minute speeches were given in these theaters; 20,000 "Vote Yes" slips were distributed among the employes in the mills and factories, also to the school children, to be delivered to their parents.

The most effective work was done by an independent organization developed in cooperation with an automobile dealers' association, which pasted lithographed stickers saying "Vote Yes On The Road Bond" on the wind-shields of more than 1,000 automobiles, and placed a representative in practically every voting precinct in the county on election day to electioneer for the road bond.

It is the policy of the State Highway Department to build a mile of road for each mile financed by the county; Lawrence County will therefore secure over $3,000,000 worth of roads as the result of the passage of these bond issues. Several of the main arteries are now under construction, and a few of them will be completed this year. In view, however, of the soaring costs of road construction that have developed since the bond issues were passed, there is a disposition to postpone construction work except upon the main highways where the traffic demands are sufficiently heavy to justify construction under present costs.

JOSEPH W. KENNEY,
Commissioner, New Castle Board of Trade.

Port Huron Citizens Finance Camp for Crippled Children

PORT HURON, MICH.—Okawana Camp for Crippled Children is the realest reality that has ever happened to spread sunshine over the lives of Port Huron's crippled small folk.

Miss Edna O'Neil, a nurse in charge of a small group of these youngsters, came before the Board of Directors of the Port Huron Chamber of Commerce two months ago and explained that she was trying to give the misformed and injured boys and girls a home in the great outdoors for the summer. Her request was simply that she be allowed to ask for a few voluntary contributions from Port Huron citizens to maintain the camp. At that time the children were living in a tent at the Port Huron beaches, where they had been since early in the spring, unprotected from the cold night air.

Rotary Club Underwrites Project

An investigation by the Directors resulted in unqualified endorsement and the promise of every possible aid. The matter was laid before the Rotary Club, which was glad to underwrite the project in such a way that everything from nurses to playground material is being provided to give the unfortunate youngsters an outing every summer on the sunny beach of Lake Huron.

In a grove of pines on the choicest lot on the beach is a fine building, completely equipped with electric light, gas, ample bedding, a piano, phonograph, kitchen and all the playground equipment that could be desired—all belonging to the crippled children. About thirty children are accommodated there now, with newcomers constantly arriving and others departing, for the plan is to have every cripple spend at least two weeks in the summer camp.

The Rotarians held a meeting at the camp a short time ago and brought nine watermelons for the kiddies. As they were doing stunts to amuse the campers, Dr. Sharp, of the Educational Department of the Ford Motor Company, drove into the park with two crippled children who were going to enjoy the benefits that the club had helped to provide. With the warmest praise, the doctor spoke of the wonderful name given to Port Huron by the establishment of the camp.

More than 100 children will be cared for the first summer, and a furnace has been provided to make the camp a year-round affair. And all the kiddies have to do to get anything they want is to call on the Chamber of Commerce.

CHARLES W. HAENSEL,
Manager, Port Huron Chamber of Commerce.

What do you think the Playground means to these Youngsters?

Have you ever thought that on the playground children find their greatest opportunity to make the most of fresh air and sunshine—to allow their growing bodies to develop as nature meant them to? Have you ever thought of it as the birthplace of democracy, where all the children meet on a common plane—the field of ambition, where the will to excel finds expression in a manly and womanly way—where the weaklings become strong and the robust stronger?

As a public official, it is your duty to help the children to build well today—by this you will be remembered in the community to which you were a benefactor.

MEDART

PLAYGROUND EQUIPMENT

For fifty years the Medart Company has been manufacturing and perfecting gymnasium apparatus for vigorous men—an experience that has particularly fitted it for the leadership it has always maintained in the playground movement and in the development of playground equipment best suited to withstand the severe use and abuse of the children.

Send for Catalog "L"

Catalogue "L" fully describes Medart Playground, Swimming Pool, Gymnasium and Locker Room Equipment. Contains valuable suggestions for playground installations. It will be sent gladly to anyone requesting it on their letterhead.

Fred Medart Mfg. Company
Potomac and DeKalb Sts. St. Louis, Mo.

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

City Contract Held Invalid by Reason of Unwarranted Rejection of Prior Bids and Its Requirement of Material, Not the Subject of Competitive Bidding

The city of Milwaukee recently lost a lawsuit before the Wisconsin Supreme Court, involving the validity of a contract for the purchase of concrete posts. (Neacy vs. City of Milwaukee, 176 Northwestern Reporter, 871.)

The case turned mainly on two points—(1) a rejection of all bids under original specifications, because the Commissioner of Public Works found that the lowest bidder was not competent and reliable; and (2) the use of patented products.

On the first point the Court holds that where the Commissioner recommended rejection of the lowest bid and acceptance of a higher bid because of incompetence of the lower bidder, but after the Council refused to adopt his recommendation rejected all bids and drew up new specifications and let the contract to a bidder thereunder, the contract was void; the Commissioner having no discretion under the Milwaukee charter to reject bids except where all bids are unreasonably high.

The contract in question was also held to be void on the independent ground that there had been no compliance with a section of the city charter relating to doing of public work involving a patented article, process or combination.

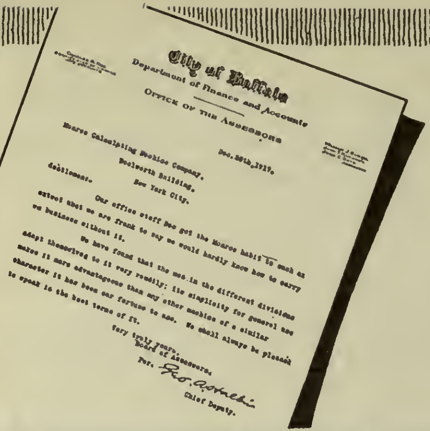
"But, independent of this charter provision," declares the Wisconsin Supreme Court, "the same conclusion is necessarily reached by the application of a rule of law well established in this state to the effect that, where a city charter requires public work to be let upon competitive bids, material which does not constitute the subject of competitive bidding cannot be used. * * * The principle of this case was somewhat limited in Kilvington v. City of Superior * * * where it was held that the principle did not affect such general city powers as lighting streets, purchase of a fire engine, or the destruction of garbage, etc., which are generally and broadly conferred by other clauses of the charter as to which the requirement for competitive bidding is construed as merely regulative and not to require competitive bidding to apply where it cannot. * * * As a rule, a patented article is not the subject of competitive bidding. If, however, the article, for any other reason, is not the subject of competitive bidding, its use is just as obnoxious to the charter provisions requiring competitive bidding. So, fundamentally, it makes no difference here whether or not this post is a patented article."

Abolishing Civil Service Positions

In the interest of economy, the Seattle City Council was empowered to abolish the position of chief accountant in the office of the City Comptroller, the action being taken in good faith. And the incumbent of the position being discharged, on transfer of the duties of the position to other qualified employes in the department, cannot compel his reinstatement, he having no preference right of employment under the civil service rules superior to the right of any of those to whom his duties were so assigned. (Washington Supreme Court, State vs. City of Seattle, 187 Pacific Reporter, 339.)

Contract Void for Want of Mutuality

An agreement by an electric company to furnish a municipality with all electric current desired by the latter during a stated term of years is void for want of mutuality, if the municipality does not obligate itself to purchase any definite quantity of current.



City of Buffalo
Department of Finance and Accounts
Office of the Assessors

Dec. 26th, 1919.

Monroe Calculating Machine Company,
Woolworth Building,
New York City.

Gentlemen.

Our office staff has got the Monroe habit to such an extent that we are frank to say we would hardly know how to carry on business without it.

We have found that the men in the different divisions adapt themselves to it very readily; its simplicity for general use makes it more advantageous than any other machine of a similar character it has been our fortune to use. We shall always be pleased to speak in the best terms of it.

Very truly yours,
Board of Assessors,
Per. Geo. A.
Chief Deputy.

The Monroe in the City of Buffalo

What State, County and City Officials Say:

"We find the Monroe a great *time saver* in making our cost and time records and in preparing engineering estimates."—***T. G. Pihlfeldt, Eng. of Bridges, Dept. of Public Works, Chicago.***

"Without the Monroe we never would have made the record of handling such a mass of detail calculations as we did in computing land values on 400,000 separate parcels of real estate in Los Angeles County."—***James G. Stafford, Supt., Joint Bureau of Appraisal, Los Angeles, Cal.***

"One man with a Monroe Calculating Machine can do the work of seven men without the machine. The investment in Monroes in one year saved us at least $85,000."—***John J. Merrill, State Tax Commissioner, New York State.***

WHEN the Commissioner of Finance and Accounts of Buffalo, N.Y., started to cut costs in his department, one of the things he did was to install a Monroe Calculating Machine.

Now, as his Chief Deputy so aptly puts it, "We would hardly know how to carry on our business without it."

Because of its simplicity of operation, the Monroe has found favor with city, county and state officials all over the country. No trained operators are needed. A turn of the crank—forward to multiply or add; backward to divide or subtract—and there's your answer in the dials, absolutely correct—checked and proven.

The Monroe is cutting costs for state, county and city governments—in the Water Department, Treasury Department, Engineering Department, Comptroller's Office, Bureau of Appraisal, Public Works and the Auditor's Office. It can do the same for you.

Convince yourself. First by reading the comments from users. And then—without expense or obligation—let a demonstrator call and prove Monroe value to you as it is to hundreds of city, county and state offices everywhere. The coupon is your invitation.

MONROE
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Calculating Machine

The "SHOW ME" Coupon-Mail it today

Monroe Calculating Machine Co., Woolworth Bldg., N. Y.
Without obligation (check items desired)
☐ Arrange for a demonstration in our office on our own work
☐ Send us a copy of "How New York State Saved $85,000"
Firm Name........................
My Name........................
Address........................
A. C. 8 20

(United States District Court, Northern District of Iowa; Northern Iowa Gas & Electric Co. vs. Incorporated Town of Luverne, Ia.; 262 Federal Reporter, 711.)

Regulating Public Utilities

Doubt as to the existence of a power in a municipality to control public utilities must be resolved against the city, since municipalities may exercise such powers only as are clearly conferred upon them by express or implied provisions of law. The rule applies to the question whether a city has power to fix rates that may be charged for service by a public utility company.

"Any contract ordinance passed by the city with statutory authority fixing by agreement street car fares, as an incident to the granting of franchises to a street railroad company, is subject to legislative control. * * *

"All regulations and contracts relative to transportation rates for common carriers, whether made by legislative authority or otherwise, are subject to a proper exercise of the police power of the state, under which power such rates may from time to time be increased or reduced or otherwise regulated as the interests of the public and the organic property rights of the carriers may require. The inherent and reserved police power of the state cannot be abrogated by legislative enactment."

An ordinance of the city of Jacksonville, Fla., limiting fares chargeable by a street railway company to five cents, is subject to abrogation by the state, acting through its board of railroad commissioners, on its appearing that justice to the carrier, as well as to the public, demands a change. (Florida Supreme Court, State vs. Burr, 60.)

Taxicab Stand Ordinance Giving Arbitrary and Discriminatory Power Over Issuance of Permits Held Invalid

An ordinance providing that no taxicab or for-hire automobile shall be permitted to stand on streets without a permit from the Department of Public Safety, designating the location at which such vehicle shall be permitted to stand, is in violation of the Louisiana and Federal constitutions.

In laying down this legal proposition in the recent case of City of New Orleans vs. Badie, 83 Southern Reporter 826, the Louisiana Supreme Court said, in part:

"The city, through its council, is vested with control over its streets, and, save for the purpose of public passage and travel thereon, may prohibit their use altogether as places of business; hence it may also make reasonable regulations for their use, in whatever way it chooses, so long as such rules apply uniformly to all persons of the same class. However, this power does not permit it to arbitrarily select those to whom such privileges may be granted, without some uniform system by which all in the same class may avail themselves therof by complying with the regulations so imposed. This does not mean that the city may not limit or prescribe the time, place, number, etc., of those who may use the public thoroughfares, but simply precludes it from exercising in an arbitrary and discriminatory manner that control over the public property which it holds in trust for the people at large.

"The ordinance attacked leaves it to the unregulated discretion of the Department of Public Safety as to whom permits shall be issued to occupy any part of the streets with a public livery car. We are informed in oral argument that this was done because the city conceded to the property owners abutting the public streets the right to say who shall occupy the streets in front of their places of business, since they have the right to keep same clear for the use of their customers and themselves. However, this only renders the system all the more obnoxious, for, as was also stated in argument, such proprietors are permitted to award such stands to the one who will pay the largest rental, thus not only allowing an individual to rent the public streets for his private benefit, but also placing in the hands of the department, or officer to whom the discretion of granting or refusing the permit is given, a formidable weapon for oppression or corruption, depending solely upon the wisdom and integrity of the officer."

Liability for Injury to Children

A city is not liable for injury to a boy who fell from the top of a stone wall surrounding a reservoir in a public park into a street twenty feet below, while playing on the wall coping, on a theory that in not preventing access to the wall the place constituted a nuisance attractive to the children, within the meaning of the rule of law which requires one to anticipate trespasses by children upon attractive but dangerous places. (Missouri Supreme Court, State ex. rel. Kansas City vs. Ellison, 220 Southwestern Reporter, 498.)

Keeping Street in "Proper Condition"

The failure of a municipality to keep its streets in "proper condition," as required by its charter, may result from a defective condition of a street itself, or may be due

"HOW TO GET A GOOD WATER SUPPLY"

This is the title of an interesting 20-page booklet published by

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A SPECIALIST IN WATER SUPPLY ENGINEERING

with main office at

THE CUTLER BUILDING
ROCHESTER, N. Y.

written particularly for municipal officials considering an addition to a present supply or the seeking of a new one .· .· .· .·

Sent free on request

to an obstruction upon such street, so that the duty of a city to keep its street in such condition may be breached, either by allowing the thoroughfare itself to become in a defective condition, or by allowing obstructions to be placed on and be permitted to remain upon such street. (Florida Supreme Court, Stallings vs. City of Tampa, 83 Southern Reporter, 625.)

Municipal Officers' Accounts

Where a City Council enters into a settlement of a city official's accounts, the settlement is binding upon the city, in the absence of fraud or mistake, especially where through lapse of time the official is prevented from restating his account. Applying this rule to a suit on the bond of a chief of police, to compel an accounting for fines, etc., received by him, the Arkansas Supreme Court recently said in the case of City of Jonesboro vs. Montague, 219 Southwestern Reporter, 309:

> "The City Council, under the statute, was the proper tribunal to audit the accounts of Montague and settle with him. When the powers to be performed by the governing body of municipal corporations are of a ministerial, administrative, or executive nature they may delegate the power to a committee. The business of municipal corporations, like other corporations, must be conducted through agents. To segregate a municipal corporation from all other corporations in the methods employed in the transaction of business would prove highly detrimental to all concerned, and, if it could not act upon any matter properly before it which also affected the rights of its officers, few competent persons could be induced to accept such offices. The Finance Committee had the authority to audit, examine, and allow the accounts of Montague. Within the scope of its authority, in the absence of fraud or mistake, the action of the committee will bind the City Council. The audit and allowance had the force and effect of a settlement between individuals. It was an admission by the committee that the accounts of Montague were correct, and, while it was in no sense an adjudication of the state of his accounts, it had the force and effect of a settlement and was valid and binding upon the city in the absence of fraud and mistake."

Courts Will Assume That Charter Power Given Boards to Hear Appeals from Orders Discharging Civil Service Employes is Properly Exercised

The wisdom of provision in a city charter authorizing appeals from orders discharging civil service employés is not a question which the courts can consider.

The power given the civil service board by Oakland Charter, Sections 81, 82, to determine the "matter under investigation" on appeal by a discharged employé includes the power to determine not only the guilt of employé, but also the punishment he should properly receive, and the board could reinstate the employé with loss only of pay for the time since his discharge.

That a civil service board may abuse its powers on appeal from orders discharging employés does not show that the power was not granted by the charter, since the presumption that public officials will do their duty applies to the board. (California District Court of Appeal, Hackett vs. Morse, 188 Pacific Reporter 308.)

Measure of Damages and Benefits for Street Improvements

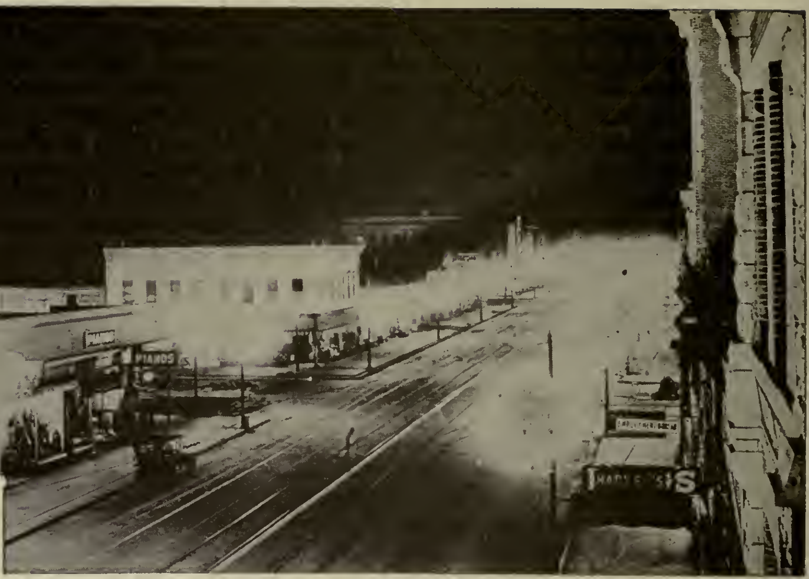
A property owner's measure of damages for improvement of a street in front of his property whereby the grade was changed is the difference in the market value of plaintiff's property as a whole before and after the improvement.

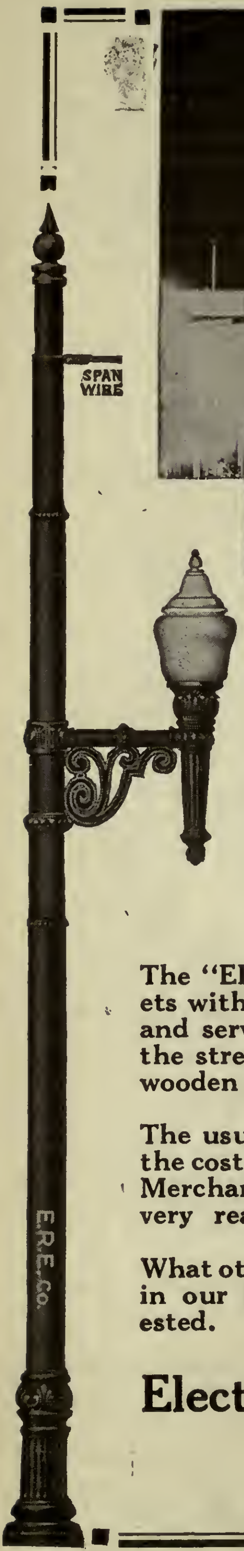
In determining damages for street improvements, the municipality is entitled to the benefits special to abutting property, notwithstanding that all other property along the line of the improvement may be similarly situated, but the abutting owner is not to be charged with any general indefinite appreciation of the value of property in the neighborhood as distinguished from special benefits to his and other properties resulting from the improvements.

Where a street is improved by paving, the benefit thereby conferred is its cost as properly assessed against urban property by the foot-front rule, although where other features, including change of grade, are present, the rule of market value may be applied. (Pennsylvania Supreme Court, Gaughan vs. City of Scranton, 109 Atlantic Reporter 682.)

General Charges of Incompetency Upheld in Removal of Fire Chief

In proceedings before a city council for the removal of the fire chief, the charges need not be stated with the technical accuracy required in a complaint filed in court.





A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

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The "ELRECO" Steel Poles support ornamental lighting brackets with modern General Electric Lighting units; also, the span and service wires of the Railway and Lighting Company; keep the streets free and unobstructed from extra Lamp Standards, wooden poles, and a multiplicity of wires, etc.

The usual practice of financing such an installation is to divide the cost between the local Street Railway and Lighting Company, Merchants and the City, making the cost of "WHITE WAY" very reasonable.

What other progressive cities have accomplished is well illustrated in our handsome Catalog "F", sent on request to those interested.

Electric Railway Equipment Company

CINCINNATI, OHIO.

New York Office — 30 Church Street

Charges that the appointment of a fire chief was irregular, that he did not respond promptly to fire alarms, did not know the location of hydrants, was incompetent to direct the fighting of fire, kept at a fire station a horse unfit for work, and failed to tear down certain buildings as required by state fire marshal, are sufficient, if proved, to authorize his removal. (Montana Supreme Court, State, ex rel. Griffiths vs. Mayor of City of Butte, 188 Pacific Reporter 367.)

In Absence of Legislation City Authorized to Employ Notary

A city has no implied authority to employ a notary to take affidavits of applicants for building permits, or other affidavits, for the purpose of expediting the city's business.

In reaching the above stated conclusion in the case of Black vs. City of Pittsburgh, 109 Atlantic Reporter 616, the Pennsylvania Supreme Court recently said:

> "We are clearly of opinion that the plaintiff has not shown any employment by the city. While it may be that it was convenient in the transaction of the city's business in issuing building permits to have a notary public in the office, no law has been pointed out to us which would authorize the employment of such a person by the city. If a petition verified by affidavit was required by law, from applicants for building license, it was the duty of those applicants to furnish such a petition, and consequently to pay for it, in the absence of any legislation putting that duty upon the city."

Riparian Rights

A municipality cannot restrain an owner of land touching navigable water from constructing a bathing pavilion between the high and low water marks, navigation not being thereby obstructed. (Connecticut Supreme Court of Errors, Town of Orange vs. Resnick, 109 Atlantic Reporter, 864.)

Unconstitutional Sections of Charters

Unconstitutionality of clearly separable provisions of a municipal charter does not invalidate the whole charter. Mere pendency of proceedings to determine the validity of a new charter do not deprive it of its character as controlling the rights and powers of the city. (West Virginia Supreme Court of Appeals, Fairmont Wall Plaster vs. Nuzum, 102 Southeastern Reporter, 494.)

On the Calendar of Conventions

August 9.—Chapel Hill, N. C.
North Carolina Commercial Secretaries' Association. Annual meeting. Secretary L. H. Duncan, Rocky Mount, N. C.

August 10.—Portland, Ore.
American Society of Civil Engineers. Annual convention. Acting Secretary, H. S. Crocker, 33 West 39th Street, New York City.

August 16-17.—Madison, Wis.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary, Don E. Mowry, Board of Commerce, Madison, Wis.

August 17-27.—Chautauqua, N. Y.
Open Forum National Council. Summer school of open forum methods. Secretary, Harold Marshall, 359 Boylston Street, Boston, Mass.

August 24-26.—York, Pa.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

August 24-26.—Everett, Wash.
Washington State Association of County Commissioners. Annual convention. Secretary, J. W. Slayden, Tacoma, Wash.

August 25-27.—Roanoke, Va.
League of Virginia Municipalities. Annual convention. Secretary, L. C. Brinson, Portsmouth, Va.

August 25-27.—Windsor, N. S.
Union of Nova Scotia Municipalities. Annual convention. Secretary, Arthur Roberts, Town Solicitor, Bridgewater, N. S.

September 1-3.—Toronto, Ont.
Ontario Municipal Association. Annual meeting. Secretary, B. H. Spence, 705 Lumsden Building, Toronto, Ont.

September 7-10.—Holyoke, Mass.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, Dedham, Mass.

September 13-16.—Los Angeles, Calif.
Pacific Coast Association of Fire Chiefs. Annual convention. Secretary, Ex-Chief H. W. Bringhurst, Seattle, Wash.

September 13-17.—San Francisco, Calif.
American Public Health Association. Annual meeting. Secretary, A. W. Hedrich, 169 Massachusetts Avenue, Boston, Mass.

September 19.—Concord, N. H.
New Hampshire State Firemen's Association. Annual convention. Secretary, Oscar P. Stone, Manchester, N. H.

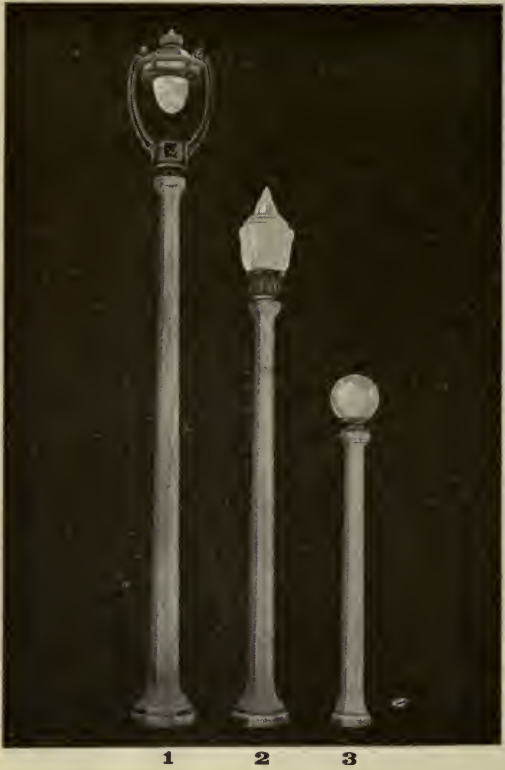
September 20-23.—New Orleans, La.
Southwestern Water Works Association. Annual convention. Secretary, E. L. Fulkerson, 617 Washington Street, Waco, Tex.

October 12-15.—St. Louis, Mo.
American Society of Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, 404 Lincoln Avenue, Valparaiso, Ind.

October 13-15.—Amherst, Mass.
American Civic Association. Annual convention. Secretary, E. E. Marshall, Union Trust Building, Washington, D. C.

October 16-19.—Springfield, Mass.
American Country Life Association. Annual conference. President, Kenyon L. Butterfield, Amherst, Mass.

October 19-22.—New Orleans, La.
International Association of Municipal Electricians. Annual convention, Secretary, Clarence R. George, Houston, Tex.



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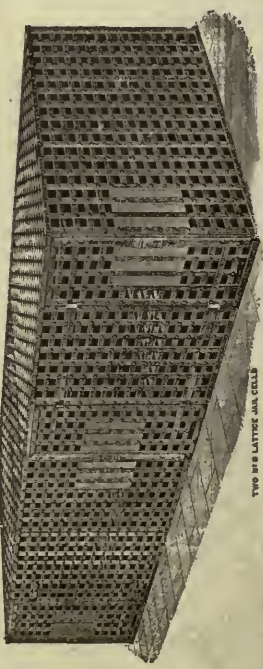
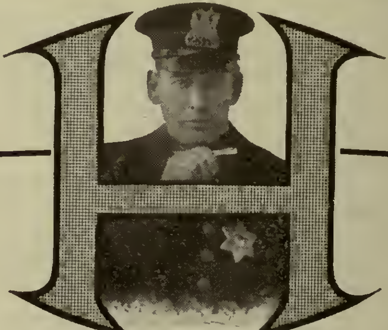

TWO BIG LATTICE JAIL CELLS

Jail Entrance Doors, Jail Bedsteads. Window Guards. Steel Plate Lining, Stairs, Folding Steel Bunks.

SEND FOR CATALOGUE IF INTERESTED.

E. T. BARNUM IRON WORKS, Detroit, Mich.



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Municipal and Civic Publications

MODEL HOUSING LAW.

Lawrence Veiller. Revised Edition. 1920. Russell Sage Foundation, New York. XIV + 430 pp.

Restrictive housing legislation, with which the author of this book has long been identified, found new enemies during the war—even among the reformers. They say that the author's legislation would prevent us from doing something better than his minimum requirements permit, and they find the solution in constructive proposals such as "taxation reform," "a new industrial era," "municipal housing," the provision of rapid transit, or in a new ownership of land. As Mr. Veiller points out plainly, all depends on what we mean by the housing problem; if it is a question of quantity and not quality, one solution may be found, but if quality is considered, perhaps restrictive legislation is necessary. For him the compelling interest is the abolition of the slum. The truth of the matter is that legislation has its educational value and sets new moral as well as legal standards. If well-intentioned cities are prevented by the proposed model housing law from doing better than this law permits, the law should be changed. Constructive suggestions are in order. As the author points out, panaceas are hard to find, and, if they lean too heavily upon human nature, are likely to prove a disappointment. This 1920 edition reflects the experience of the last eight years in states and cities where the model housing law has been made the basis of laws adopted or proposed. It also recognizes demands created by the coming of the automobile as well as progress made in housing standards as a result of the government housing work. The chapter on the tenement housing law has been omitted and chapters on zoning and Federal Government standards added.

TAXATION AND RETRENCHMENT: REPORT OF THE SPECIAL JOINT COMMITTEE.

State of New York, Legislative Document No. 80. 1920. 155 pp.

This report covers a very thorough investigation into the problems of taxation and economies in the cities of New York State, analyzing the rising costs of city government, covering, among other topics, such questions as the municipal budget, municipal pensions, purchasing and the expenses of education. In every instance the committee comes to a definite conclusion and positive recommendation toward a solution of the problem. There is also one chapter given to retrenchment in county government. Municipal officials and other citizens interested in the subject of municipal expenditures will find that this report covers the field in satisfactory detail.

THE PASSING OF THE COUNTY JAIL.

Stuart Alfred Queen, Ph.D., Associate Professor of Constructive Philanthropy, Goucher College; formerly Secretary of the California State Board of Charities and Corrections. George Banta Publishing Co., Menasha, Wis. 1920. xii + 156 pp.

This book is a presentation of a scientific plan for the reclassification and handling of offenders against law. The author argues that the systems of county jails fail to serve a useful purpose in society; but the main thesis of the book is the endeavor to demonstrate that the classification of offenders as misdemeanants and felons is unscientific and unsatisfactory, that this artificial distinction should be forgotten and all prisoners treated as individuals, by a unified correctional system of state-wide organization. "This would mean genuinely indefinite sentences. Prisoners could be kept in custody for life, if necessary, even though their 'crime' might be no more 'heinous' than begging. They could, on the other hand, be released as soon as they might prove able to take their part in normal social life again, even though their crime had been murder. Only by such a system as this does it seem possible to deal with the offender as a man." p. 142.

FIRE INSURANCE INSPECTION AND UNDERWRITING.

Charles C. Dominge and Walter O. Lincoln, Members National Fire Protection Association, Insurance Society of New York. Second Edition. The Spectator Company, New York. 1920. 763 pp. Illustrated.

ZONING AS AN ELEMENT IN CITY PLANNING, AND FOR PROTECTION OF PROPERTY VALUES, PUBLIC SAFETY AND PUBLIC HEALTH.

Lawson Purdy, Harland Bartholomew, Edward M. Bassett, Andrew Wright Crawford, Herbert S. Swan. June 30, 1920. American Civic Association, Washington, D. C. 48 pp.

This symposium on zoning includes articles by men well qualified to speak upon the subject. Some of the articles have appeared in print elsewhere. Messrs. Swan, Crawford and Bassett discuss the legality of zoning. Messrs. Bartholomew, Swan, Purdy, Crawford and Bassett cover zoning principles and progress. Some of the articles were not prepared particularly for inclusion in this bulletin, but rather for delivery as papers at conventions. The collection is an exceedingly interesting one, and what it lacks in cohesion it makes up in variety.

COMMERCIAL ORGANIZATIONS, THEIR FUNCTION, OPERATION, AND SERVICE.

A Compilation of Selected Material Provided by the National Association of Commercial Organization Secretaries, the American Association of Commercial Executives, and the Central Association of Commercial Secretaries. Edited by William George Bruce. Published by the Bruce Publishing Co., Milwaukee, Wis. 1920. 467 pp.

For the chamber of commerce executive who is looking for solid instruction and assistance in meeting the varied problems of his office this book will prove of great assistance. It covers the entire field of activity of commercial organizations, and furnishes definite, practical information on every phase. The many splendid studies made in recent years by leading commercial secretaries throughout the United States in the field of commercial organization, endeavor and secretarial efficiency, and which have until now remained submerged in a mass of association proceedings, have finally been rescued and made readily available through the presentation of this attractive and serviceable volume. The popular activities engaged in by the modern commercial organization are covered lucidly and comprehensively. These studies are valuable in that they outline scope and method as well as plan and purpose. They constitute a safe guide for all those identified with chamber of commerce work. In the light of the fact that dependable and at the same time readily accessible literature on the subject of community promotion through commercial bodies, along economic and civic lines, has heretofore been extremely limited, the present work is both timely and acceptable.

AMERICANIZATION.

Compiled and edited by Winthrop Talbot, A.B., M.D. Second edition, revised and enlarged by Julia E. Johnson. One of the Handbook Series. H. W. Wilson Co., New York. 1920. lxiv + 373 pp.

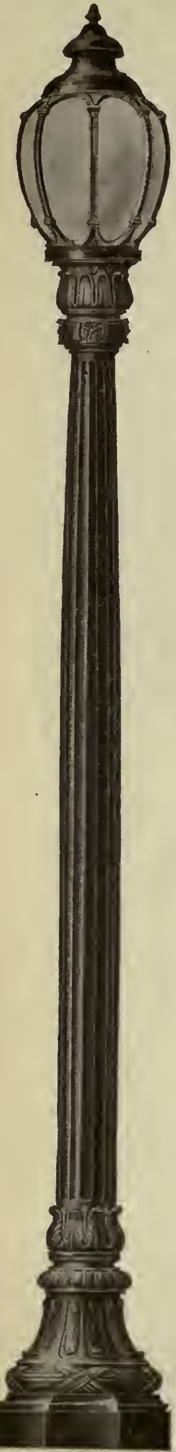
This is a compilation of speeches, articles, poems, and essays by publicists of the past, and modern writers, including such phases of the subject as "Americanization as a World Process," and "The Technic of Americanization." It gives a clear idea of what is meant by Americanization, from the time of the Revoluton to the present, and discusses the many problems of Americanization which are now being met by the church, the school, and the labor organization. An elaborate bibliography of over fifty pages is a valuable feature of the volume.

REPORT OF THE NEW YORK STATE COMMISSIONER OF HIGHWAYS.

For the year ending December 31, 1918. Published 1919. Edwin Duffy, Commissioner. 580 pp. Diagrams and many tables.

GASOLINE TRACTORS.

Charles B. Hayward, President and General Manager, The Stirling Press, New York City. American Technical Society, Chicago. 1920. 175 pp. Photographs and diagrams.



Modern and Serviceable

Modern ornamental street lighting renders various services of material benefit. First, it provides efficient illumination for your city. Second, it protects the lighted area from any possible crime. Criminals of all kinds prefer to work in the dark. They abhor light.

There are several other benefits to be derived from up-to-date street lighting, and if you are interested in maintaining the prestige of your city—if you are interested in creating civic pride—if you are interested in making a better city—send for our illustrated booklet.

APPEARANCE

Our ornamental lighting system is on the job 24 hours out of every 24. At night it lights up your business streets, residential sections, parks and boulevards. During the day the handsome poles greatly aid in beautifying your city. There is nothing that can make a town more attractive than a neatly laid out system of ornamental street lighting.

Send your address for big descriptive booklet including many styles and designs.

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53 W. Jackson Boulevard
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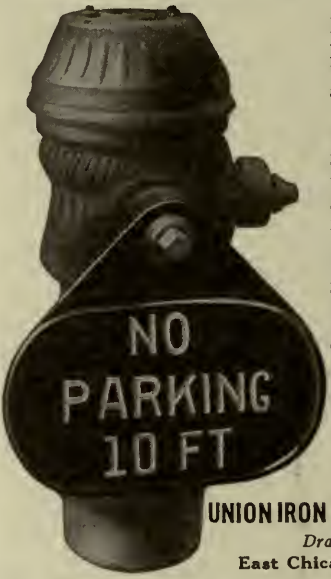

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"Wearproof" Signs possess the countersunken lettering time will not obliterate. Also, Street Signs, Highway Markers, Semaphore Traffic Signs, Danger Signs, etc.

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PATENT ANTI-FREEZING

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Is the only drinking fountain made that was designed and is built solely for outdoor use. It does not have to be turned off at the approach of cold weather.

THE ONLY FOUNTAIN MADE THAT IS STRONG ENOUGH TO WITHSTAND PUBLIC ABUSE.

Perfectly adapted for use on the Public Streets, in Parks, Playgrounds, School Yards, and all semi-exposed or uncertainly heated enclosures.

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The MURDOCK MFG. & SUPPLY CO.
(THE ORIGINAL HYDRANT HOUSE)
CINCINNATI, - - - - - OHIO
Builders of Water Service devices since 1853

THE CONSOLIDATED RURAL SCHOOL.

Edited by Louis W. Rapeer, President, Research University, Washington, D. C.; President, Federation for American Childhood. Charles Scribner's Sons, New York. 1920. XIII + 545 pp. Illustrated.

In the province of education there are few subjects of more practical importance at this time than the consolidation of rural schools. This volume covers the questions which arise in connection with such schools, some of the chapters having been written by the editor, and the rest by other well-known authorities. The book is based upon investigation and nation-wide acquaintance with this type of school, and its conclusions are cautiously worked out and illustrated. It is provided with an exhaustive bibliography on consolidation and a topical index.

VISUALIZING CITIZENSHIP.

This is the title of a 32-page pamphlet (Special Report No. 4), prepared by Ina Clement and issued June 23, 1920, by the Municipal Reference Library of the City of New York as a supplement to Miss Clement's earlier study (Special Report No. 2) entitled "Teaching Citizenship via the Movies." This new report is the result of accumulated information on the subject during two years. Among the phases presented in the study are the following: the aid which motion pictures may give in constructive Americanism; the filming of state and city activities; the use which church and welfare organizations have made of motion pictures; the film as an aid to classroom work; film libraries; and agencies interested in the educational film. A descriptive subject list of civic films is given. (Apply to the Municipal Reference Library, Municipal Building, New York, N. Y.)

SIMILARITY OF MILITARY AND COMMERCIAL MOTOR TRANSPORTATION.

An address, under above title, by Colonel B. Taylor, of the Motor Transport Corps, U. S. Army, delivered at the Highway Transport Conference in New York in 1920. Published by the Motor Truck Committee of the National Automobile Chamber of Commerce, Inc., 7 East 42d Street, New York City. 8 pp. Setting forth the need of a national coördinating authority. (Apply to the Committee, as above.)

COMMUNITY AMERICANIZATION.

A handbook for workers, prepared by Fred Clayton Butler, Director of Americanization, Bureau of Education, and published by the Bureau as Bulletin, 1919, No. 76. 82 pp. Illustrated. The contents are taken largely from the lives and experiences of successful workers in Americanization. The first chapter sets forth the general principles of the work, and the spirit in which it should be undertaken. Other chapters deal with the educational and social phases of the problem, and organizing the community, and a tentative plan for a community survey is given. There is also a bibliography of over 5 pages. 1920. (Apply to the Government Printing Office, Washington, D. C.)

THE PLANNING OF HOUSING SCHEMES.

A paper by A. S. Soutar, read at the meeting of the Town Planning Institute of London on February 6, 1920, with the discussion thereon. Quarto. 80 pp. Published by the Town Planning Institute, 4 Arundel Street, London, W. C., England.

STANDARDS OF CHILD WELFARE.

A report of the Children's Bureau Conference held in May and June, 1919, and published as Bureau Publication No. 60. 459 pp. The papers given are grouped in five sections: The Economic and Social Basis for Child Welfare Standards; Child Labor (legislative prohibition and regulation of employment, and vocational guidance and placement); The Health of Children and Mothers (maternity and infancy, the preschool child, the school child, and European experiences); Children in Need of Special Care (the function of the state, care of dependent children, juvenile delinquents and mentally handicapped children); and Standardization of Child Welfare Laws. Section VI contains the list of members of the committee appointed by the Washington conference to formulate minimum standards of child welfare, and the standards themselves. (Apply to the Children's Bureau, Washington, D. C.)

ARMOURDALE: A CITY WITHIN A CITY.

The report of a social survey of Armourdale, a community of 12,000 people living in the industrial district of Kansas City, Kans. The study was made at the suggestion of Mr. Wilson of the Kansas City Chamber of Commerce, who offered the use of some valuable data which the Chamber of Commerce had gathered. The Director of Survey was Manuel C. Elmer, Associate Professor of Sociology of the University of Kansas, and the field workers were members of the classes in Social Surveys and Community Organization of the Department of Sociology of the University. 1919. 91 pp. Published as a Bulletin of the University of Kansas, Vol. XX, No. 12, June 15, 1919. (Apply to the University Extension Division, Lawrence, Kans.)

RIOTS AND RIOT DUTY.

By Edward S. Farrow, Late Assistant Instructor of Tactics, United States Military Academy, West Point. A manual for the use of troops in aid of the civil authority, setting forth the principles underlying the organization and tactical work of all types of local defense units, the handling of the crowd and the attack on the mob. 1919. Handy size. 44 pp. (Address the Military-Naval Book Corporation, Asbury Park, N. J.)

REST ROOM SUGGESTIONS.

Public Comfort Station Code and Rest Room Suggestions adopted by the Wisconsin State Board of Health, pursuant to the Public Comfort Station Act, which requires that all cities and incorporated villages provide and maintain a sufficient number of public comfort stations. Various sketches illustrate the housing of a rest room in connection with a store or a mercantile establishment. Prepared by the Plumbing and Domestic Sanitary Engineering Division of the Wisconsin State Board of Health. 1920. 62 pp. (Apply to the Division.)

HEALTH CHARTS.

Second edition of the third pamphlet report of the Joint Committee on Health Problems in Education of the National Council of the National Education Association and the Council on Health and Public Instruction of the American Medical Association. Containing reproductions of 8 charts which have been prepared and made available by the Joint Committee for use when desired, not only in rural schools, but also in city schools or communities. The charts are intended to present important facts and beliefs affecting particularly the health of the school children and the health conditions of the schools. (Address Dr. Thomas D. Wood, 525 West 120th Street, New York City.)

Municipal Reports

Buffalo, N. Y.—Annual Report of the Department of Health for the year ending December 31, 1919. (Apply to Francis E. Fronczak, Health Commissioner.)

East Cleveland, Ohio.—Second Annual Report of the City of East Cleveland, Ohio, under Commission-Manager Plan of Government. 1919. (Apply to C. M. Osborn, City Manager.

Easton, Pa.—Mayor's Message. Controller's Report, Department Reports for the fiscal year 1919. (Apply to J. H. Warner, City Clerk.)

Greenwood, S. C.—Annual Reports of the Town Council and the Water and Electric Light Plant for the year 1919; receipts and disbursements. (Apply to J. R. Devlin, City Clerk.)

Hartford, Conn.—Eleventh Annual Report of the Juvenile Commission to the Mayor and Court of Common Council for the year ending April 30, 1920. (Apply to the Juvenile Commission.)

Portsmouth, Va.—Mayor's Annual Message, together with municipal reports for the twelve months ending December 31, 1919. (Apply to L. C. Brinson, City Clerk.)

Rockford, Ill.—Tenth Annual Report of the Board of Commissioners, Rockford Park District, covering the period from January 1, 1919, to December 31, 1919. (Apply to Paul B. Riis, Superintendent, Rockford Park District.)

Watch the next truck you see pounding along on solid tires—listen to it jarring from bump to bump in the roadbed. Is it any wonder the average truck engine needs frequent repairs and adjustments?

Watch a solid-tired truck trying to pull a load in soft mud or on a wet, slippery road. Lack of traction wastes half the engine's power.

The old type solid tire is fast becoming obsolete. It does not protect the truck; it does not give traction.

What is to take its place? Owners of many of the largest truck fleets in America have found the answer in Kelly Caterpillars, the first cushion type tires to be successfully used on trucks of all weights and sizes.

The Caterpillar is resilient. It gives amazing traction. It gives phenomenal mileage. It has every advantage of the big pneumatic with none of the pneumatic's disadvantages. It costs less than the big pneumatic and gives double the mileage.

And it is *dependable.*

Kelly-Springfield Tire Co.

GENERAL SALES DEPARTMENT

1710 Broadway, New York, N. Y.

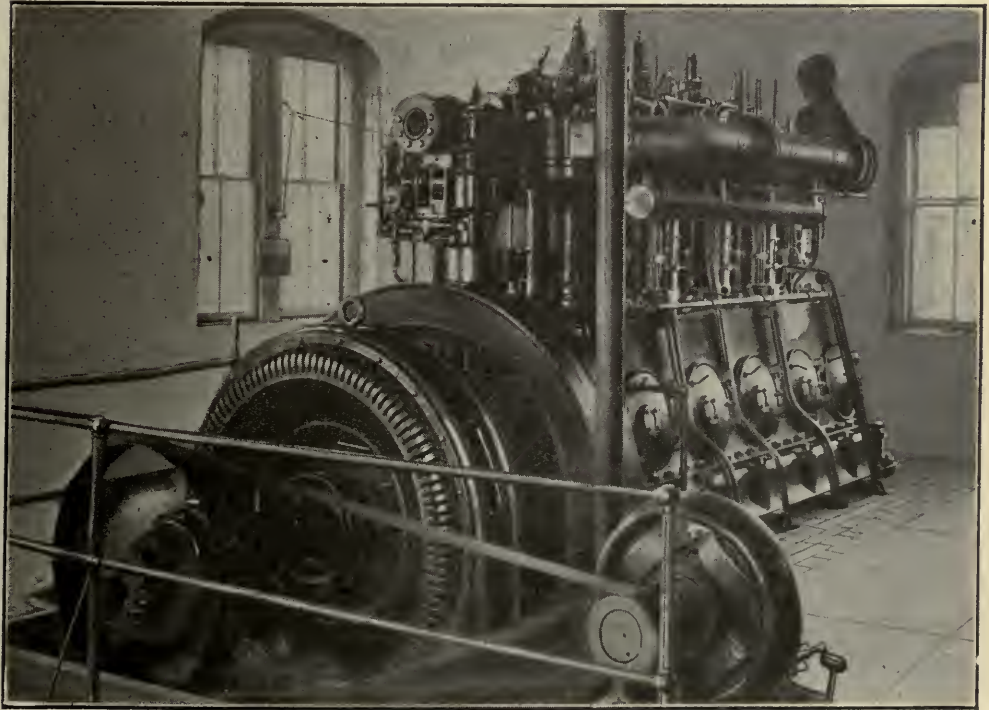
Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

What the Daily Log Sheet Shows for Diesel Engines

Many municipal engineers appreciate the value of the daily log sheet in checking up the operation of prime movers of various types. C. M. Dawson, engineer of the Municipal Water and Light Department, Baldwin City, Kans., turned in a daily log sheet to the Busch-Sulzer Bros.-Diesel Engine Company of St. Louis, Mo., showing a 24-hour run on a 165-horse-power Diesel engine used at that plant. This log sheet showed an average output of 33.87 kilowatts per hour, or a total of 813 kilowatt hours for the day, using an average of 5.17 gallons of fuel oil per hour, or a total of 124 gallons. The engine used 1 gallon of lubricating oil costing 58½ cents per gallon. Fuel oil cost 5 cents per gallon. An analysis of this log shows that the cost per kilowatt hour for fuel oil was 0.76 cents and for lubricating oil 0.90 cents, making a total of 0.85 cents per kilowatt hour for the operation of this engine, exclusive of labor and depreciation. For the year April 1, 1918, to April 1, 1919, this plant showed a net financial return on its Diesel engine investment of 31.5 per cent, while the net financial return on the entire plant investment was 21.4 per cent. The engine operated 96.3 per cent of the possible time, the average weekly shut-down being about 3 hours. The personnel of the plant consists of one chief engineer and two assistant engineers. Thus far the repair costs have run about 1 per cent of the engine's price, this including an overhauling of the engine once every three years.

Another notable installation of Diesel oil engines, at Appleton, Wis., consists of two 225-b.h.p., three-cylinder, four-stroke cycle engines. Each engine is directly connected to two Dean double-acting triplex pumps of 2,000,000-gallon capacity each. The pumps are located one on each end of each engine shaft. Two Allis-Chalmers 15-k.w., 110-volt, direct-current generators are also connected by link-belt silent chains, one to each engine.



AN ECONOMICAL DIESEL ENGINE INSTALLATION AT BALDWIN CITY, KANS.

A Federal 2 ton Dump Truck owned and operated by Dept. of Public Works, British Columbia

"If Federals are so successful in every kind of business, they should be successful, too, for our work."—

Such is the logical line of reasoning of many municipal public works officials. For not only have the Federal trucks been noted for dependability—their rugged chassis, mechanism and power of motor contributing to gain this recognition—but also for low operating costs and maintenance. The records of Federal operation and maintenance will compare favorably with any truck on the market.

The Tenth Year FEDERAL TRUCKS

This is the sign of the Tenth Year Federal, a sign significant of ten years of success in every field of truck transportation.

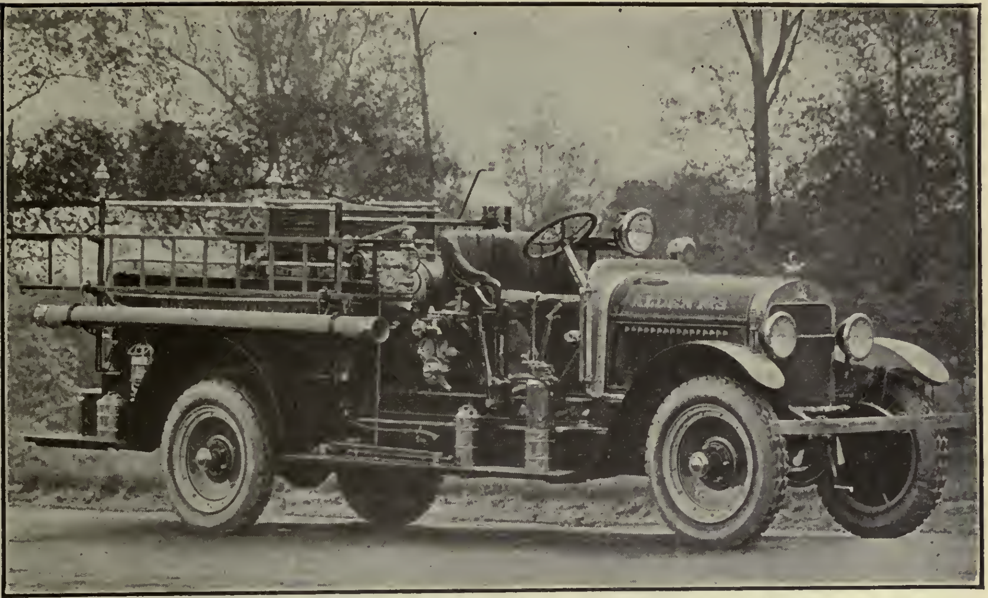
Ten years' experience in building Federal trucks also has enabled the manufacturers to build a truck good not only for today but the infinite tasks and heavier loads of tomorrow. Stamina is built into the truck—and it is that stamina that pays in rich returns on the initial investment.

Federals are built in every capacity.

A request for "Traffic News" will bring you by mail a magazine telling interestingly of the tasks being performed in every field by Federals.

FEDERAL MOTOR TRUCK COMPANY
34 FEDERAL AVENUE DETROIT, MICHIGAN

Another **FEDERAL**



THIS TRUCK, THE PROPERTY OF ALDEN NO. 3, A VOLUNTEER FIRE COMPANY OF NEWPORT TOWNSHIP, PA., WENT THROUGH A REMARKABLE ROAD TEST WITH GREAT SUCCESS

Fire Truck Performs Remarkable Climbing Feat

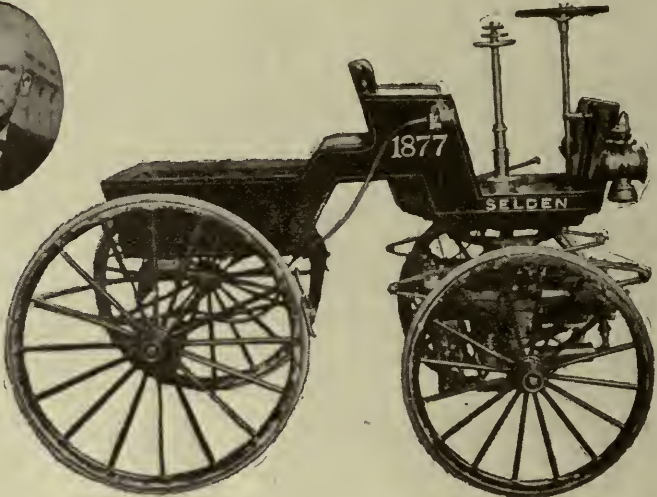
Cities with hilly districts will be particularly interested in the remarkable feat recently accomplished by a Stutz 500-gallon, triple combination pumping engine, recently purchased by the Alden Fire Company, Newport Township, Pa. The fire truck climbed the very heavy grade of Giant's Despair on the Wilkes-Barre Mountain, without difficulty in the remarkable time of 6.97 minutes. Giant's Despair Mountain several years ago helped such noted automobile racers as De Palma, Chevrolet, Harron, Christie and other famous drivers to build up their records of daring. Chief Frank Hochreiter of the Wilkes-Barre Fire Department was the official judge of this test, and so well satisfied were his fire commissioners with the performance of the Newport Township machine that a similar machine has been ordered for the Wilkes-Barre Department.

Some specific data with regard to this test may be of interest to readers of The American City. The length of the course over which the test was run was 5,700 feet, involving a 1,000-foot run of 10 per cent grade and another 1,000 feet on a 16 per cent grade, 300 feet of 15 per cent grade with a sharp turn, 700 feet of 14 per cent grade with a right-angle turn, 300 feet of 18 per cent grade, 400 feet of 12 per cent grade, 300 feet of 16 per cent grade, 300 feet of 15 per cent grade, 700 feet of 20 per cent grade, and 1,000 feet of 20 per cent grade. The total rise from start to finish was 940 feet, the distance being covered in 6.97 minutes. The machine was in first speed for 3.03 minutes, in second speed for 3.44 minutes, and in high gear for 0.5 minute. The average speed up the hill was 9.47 miles per hour. The wheel base to the truck is 163 inches, the rear tires being 38 x 7 inches, the motor size 5¼ x 7 x 4 inches delivering 68 horse-power and 1,000 r.p.m. The total weight of the truck with load and five men was 11,375 pounds, the axle reduction 5⅔ to 1, transmission low gear reduction 3.5 to 1, transmission second speed reduction 2.31 to 1, transmission high speed reduction 1 to 1.

Dry Feed Apparatus for Water-Works Chemicals

In the design and operation of filtration plants, serious consideration must be given to the method of applying the coagulant to the water to be treated. Since the inception of mechanical filtration, the making of solutions and the application of the solution to the water has been the generally accepted plan of treatment. The economy of dry feed apparatus for water-works chemicals has led many plants to install this type of chemical feed.

The Pittsburgh Filter and Engineering Company, Pittsburgh, Pa., has developed a machine which meets the popular need for a dry feed apparatus and which is low enough in cost to enable it to come into general use. The first machine of this type was placed in operation in the filtration plant at Toledo, Ohio, where it has been operating continually day and night with great success. The type O machine, shown on page 239, which is a later development of the original Toledo machine, consists of storage hopper, water-motor, feeding mechan-



The Beginning of the World's Second Largest Industry

GEORGE B. SELDEN invented, in 1877, the first internal combustion gasoline engine for road locomotion. This was the beginning of the world's second largest industry.

History affords no more startling record of achievement than the development of the automotive industry, which resulted from this remarkable invention by Selden. Selden Trucks have shared in the development of this second largest industry. Wherever in the world there has existed a need for dependable, economical, profitable haulage of commodities, SELDEN TRUCKS have served and proved their ability. SELDEN TRUCKS possess tremendous strength of construction and enormous pulling power. Actual records of users prove their cost of operation and maintenance to be low. There are no better trucks than SELDEN TRUCKS. Ask us to give you facts that will show how Selden Trucks are effecting economies in your line of business.

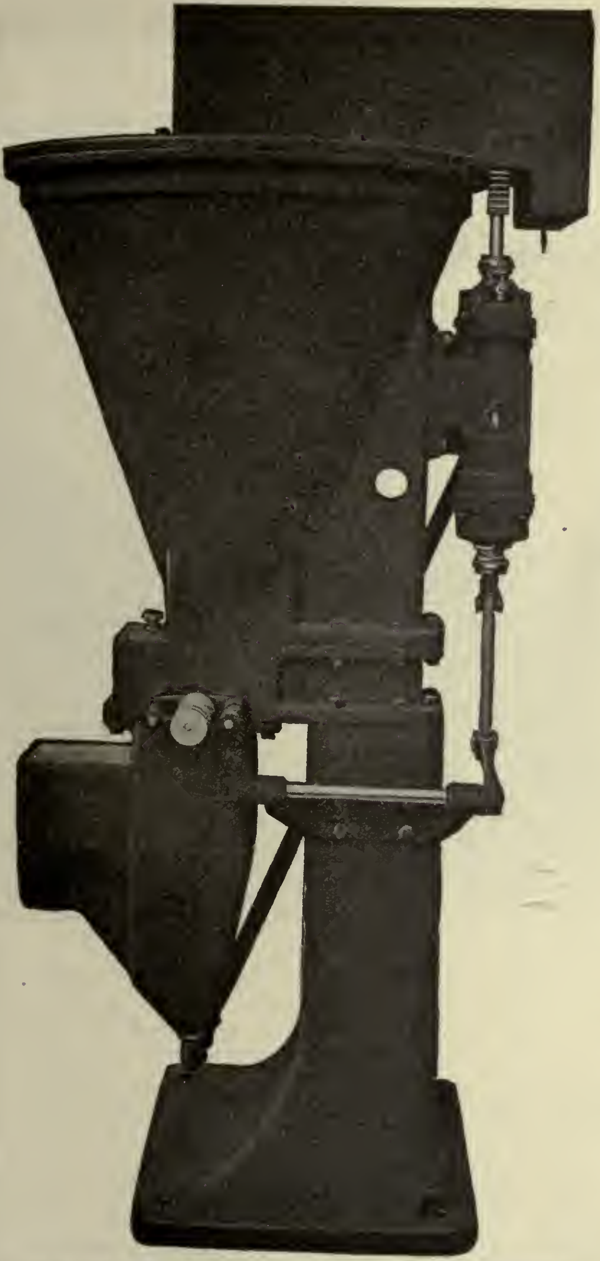
IN-BUILT QUALITY SELDEN MOTOR TRUCKS

1½, 2½, 3½, 5 Ton Models—All WORM Drive

WRITE for Booklet, "Yesterday, Today, Tomorrow," which contains a brief history of the early days of the automobile.

SELDEN TRUCK CORPORATION, Rochester, N. Y., U. S. A.

Selden Motor Trucks



A DRY-FEED APPARATUS FOR FEEDING WATER-WORKS CHEMICALS TO RAW WATER

ism and mixing chamber. The hopper is of a conical shape with a capacity of 3.3 cubic feet, or an equivalent of 218 pounds of sulphate of iron, 193 pounds of alum, 144 pounds of soda ash or 125 pounds of hydrated lime, in the dry state. On top of the hopper a cover is provided having an opening large enough to permit filling the hopper easily. This hopper is provided with ¼-inch-mesh screen which prevents large lumps of any foreign matter from getting into the machine, thereby interfering with its proper operation. The water-motor is of the duplex type and so constructed as to make it self-starting. The motor is mounted in a vertical position, securely bolted to the back of the hopper with one piston projecting through the top and the other through the bottom, thus affording a suitable drive for agitator and feeding mechanism. The speed is controlled by a needle valve placed in the pressure supply line directly ahead of the motor.

The feeding mechanism is all placed in a separate casting, which is bolted to the bottom of the storage hopper with the orifice directly under the hopper. Below the rectangular orifice is a flat pan, which oscillates, being operated by a rocker arm keyed to the end of the small horizontal shaft. The travel of the pan and cross-head is adjustable from 0 to 1½ inches. The brass pointer on the adjustable sleeve indicates the position of the sleeve and pan on a scale, which enables the operator to control the quantity of chemical being fed. This machine will feed from 0 to 1,500 pounds of hydrated lime or soda ash per day when equipped with an agitator, and without the agitator will feed from 0 to 3,000 pounds of sulphate of iron or alum per day.

New Sales Manager for Nordberg

The Nordberg Manufacturing Company, Milwaukee, Wis., has just announced that B. V. E. Nordberg, son of the pioneer engine and hoist builder, B. V. Nordberg, has been appointed sales manager of the company in place of H. W. Dow, who has resigned.

A New 3-Ton Fire Truck

Announcement is made of the development of a new 3-ton fire truck by the Four Wheel Drive Auto Company, Clintonville, Wis., makers of FWD trucks. The new fire-fighting apparatus contains an unusually powerful special type J. Wisconsin motor, with a 5 1/10-inch bore and a 5½-inch stroke, developing 42 h.p. S.A.E. The type B Rotary pump, driven through a two-speed transmission, has a capacity of 500 gallons at 120 pounds pressure. Complete modern fire-fighting equipment is mounted on the body, which is 9 feet long, 4 feet wide and 22 inches deep.

Make Streets Clean

"Studebaker Model"

FLUSHING and SPRINKLING UNITS

Forty feet from curb to curb—sand filled brick pavement—cleaned in one trip with three nozzles.

The machine has four nozzles which can be used discharging one, two or three flushing streams at the same time.

Removing the heavy accumulation of Winter or the lighter dirt of Summer is within the range of this machine due to the adjustable nozzles and the independent control of the pressure.

A horse-drawn uniform pressure flusher is provided where conditions do not justify investment in a motor flusher but where economical, efficient and sanitary cleaning is desired.

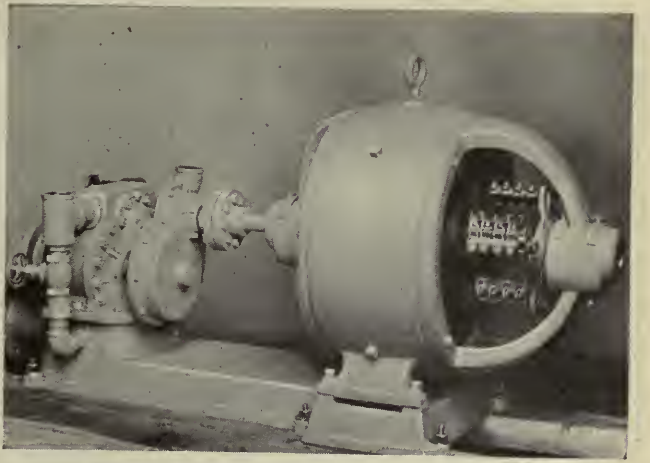
Inquire of any motor truck manufacturer or ask the truck dealer in your city for complete information on "STUDEBAKER MODEL" flushing and sprinkling units mounted on their trucks, or address

Municipal Supply Company

South Bend, Indiana

Pumps for Water-Works or Fire Service

The interest that is being shown by municipalities to-day in pumps for fire apparatus and for water-works service is tremendous. Many manufacturers have developed special pumps for each type of service. The Northern Fire Apparatus Company, Minneapolis, Minn., has developed a pump having an efficiency of 83 per cent, which it claims will deliver more gallons per minute per horse power than any other similar pump. It is guaranteed to deliver 250 gallons of water per minute at 120 pounds net pump pressure when drafting water. When mounted as a fire pump on a 3½-ton chassis, it delivers over 400 gallons of water per minute at 120 pounds net pump pressure when drafting water, and will successfully pass an Underwriters' Test at this capacity.



A ROTARY PUMP WITH ELECTRIC DRIVE FOR WATER-WORKS SERVICE

An instance of this dependability is shown in the case of Katonah, N. Y., which purchased a 1½-ton chassis, Northern-equipped, in 1916. In 1918, the town decided to buy a pump and purchased a smaller size which it installed. At a test, this pump drafted water from a lake, pumped the water through 1,500 feet of fire hose and threw a good fire stream over the tallest building. A pump test was made of a Northern pump on January 13, 1920, on the 54th Street Pier, New York City. The average lift was about 13 feet, ranging from 10 feet at high tide to 16 feet at low tide. The machine pumped 300 gallons at 120 pounds pressure in 6 hours, 200 gallons at 200 pounds pressure for 3 hours, and 100 gallons at 150 pounds pressure for 3 hours. In addition to the above test, the machine was run at full speed and delivered 475 gallons per minute at 50 pounds pressure, demonstrating its ability to operate as a booster pump. This test was run under the jurisdiction of the National Board of Fire Underwriters, whose tests are known to be the most severe pumping engine tests that any manufacturer can be called upon to undergo.

The accompanying illustration shows the Northern centrifugal mounted with electric drive for water-works service, where it can act either as a booster pump or in regular service. This rotary pump is of the positive displacement type, meaning that at each revolution a definite volume of water is moved from the suction side of the pump to the discharge side, making the pump practically self-priming. The contact surfaces between the impellers and the walls of the pump casing and between the impellers themselves perform the same functions as the valves and valve seats in piston pumps. The absence of valves in the Northern pump is one of its particular features. The capacity of the pump varies in proportion to the speed at which it is run. One of the particular claims of the manufacturers in the line of dependability and service is that the entire head of the pump is demountable. A town at very moderate cost can carry an extra pumping head in stock, which can be bolted on the pump base in place of the one originally furnished with the pumping unit if anything should go wrong with the first one. In other words, with a shut-down of only an hour the unit can be put into first-class working shape again. The broken-down unit or the defective unit, as the case may be, can be returned to the manufacturer, who will allow full credit for it less the exact cost of repairing it and putting it in first-class condition again. At that time the manufacturer will return it to the town for further usage as a spare.

Keeping Pavements Clean

From the standpoint of personal comfort, we want our streets kept clean. We dislike to have our nasal tissues tickled with flying particles or to wade across stretches of mud or oily slime on any pavement. But in addition to personal comfort, the question of health is involved. The average citizen does not consider the effect of cleanliness in the streets on the health of the community, but studies of this question by the medical fraternity have shown that many diseases are traceable either directly to germs flying about with the dust or to the irritation of the dust opening the way for later infection.

The rapid development of motorized street cleaning has been made possible by the development of motor trucks capable of carrying heavy loads, and the perfecting of the pressure system for delivering a stream of water at high pressure and at a moderate angle to the street. The motor flusher driven up the street keeps a continual wave of water under high pressure ahead of it. This wave adequately washes off all street litter and deposits it in the gutter ready for removal. The

Packard Truck with special dump body for county road development. Such municipal departments as Fire, Street Cleaning, Ash and Garbage Removal, Water Works, Post Office, etc., are getting the advantage of Packard low transportation costs in many cities.

Is the City Official Getting the Full Benefit of Continued Maintenance

FROM his own practical experience in many public departments and works, the City or County official knows the benefits of continued expert maintenance.

That is why he asks, before he buys a truck today, *"What sort of maintenance organization will you put behind my truck?"*

In more than 200 Packard Service Stations you find Uniform Service Methods, Uniform Stock-keeping Methods—a uniform system in place of the haphazard, time-consuming practice found in the average repair shop.

You find more than one hundred repair operations standardized—workmanship improved, time saved, costs reduced.

Cooperation between owner and Packard Service is carried out by a system of monthly truck inspections whereby more efficient operation and low maintenance are assured.

The Packard Technical Service Division was established to give the fullest advantage of Packard's 44 factors of engineering superiority, and the long life built into every Packard Truck.

And the official, with ever the reduction of city expenses in mind, is quick to realize the effect this Packard expert maintenance will have in cutting down city transportation costs.

"Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, *Detroit*

A STREET FLUSHER ON DUTY IN OTTAWA, CANADA

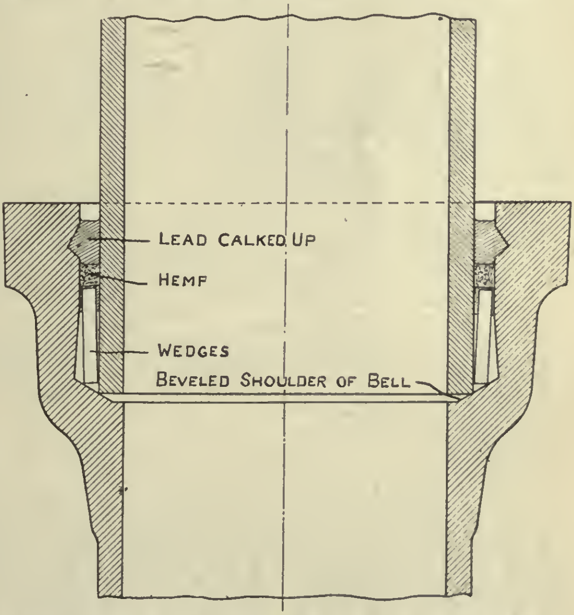
Federal Motor Truck Company, 34 Federal Avenue, Detroit, Mich., has installed flushers of this type in a number of cities, one of which, now in use by the city of Ottawa, Canada, is illustrated herewith.

In addition to removing all manner of dirt from the pavement, these flushers have been found useful in many communities for other services in cases of emergency, and in some instances by well-planned organization. By pumping from the tanks through one stream, it is possible to readily flush sewers which may not be convenient to fire hydrants. By reversing the process, cisterns, catch-basins and trenches may be pumped out in case of necessity. By filling the tank with the proper spraying solution, the motor flusher may be sent out to parks on the line of highways, for spraying trees to reduce moths and preying insects.

A New Cast Iron Pipe Joint

A prepared joint for cast iron pipe has been developed by the American Cast Iron Pipe Company, Birmingham, Ala., in order to save labor and material and to expedite the laying of bell-and-spigot cast iron pipe. The new joint is factory-made and uniform. The bell for this pipe is essentially the same as the American Water Works Association Standard bell. The bottom of the bell slopes at 30 degrees toward the center of the pipe. At the factory the pipe is up-ended so that the joints may properly be placed in the sockets of the pipe. A series of wedges held together by a lead strip is first inserted. On top of this the jute or hemp is calked. and finally the lead is cast on top of the jute. A mandrel which has been inserted into the bell to keep the joint materials in place is removed after pouring the lead, and a concrete shipping plug is placed in the joint.

The accompanying illustration shows the completed joint. After the concrete plug has been removed, the man on the job can actually look into the bell and see the lead and jute inside and be sure that everything is in perfect condition. Then the spigot end of the pipe is inserted and pushed up against the shoulder of the bell. Calking is done in the usual way. The jute is compressed between the lead strip and the top lead. It is claimed that this prepared joint fulfills the two prime elements of an ideal pipe joint, namely, rigidity and flexibility. As the calking takes place, the wedges slide down the incline until they engage the pipe all around the bottom. Then each wedge is a small anvil against which the calking is done. If there should be any settling of the pipe after it is laid, the joint automatically tightens. The self-tightening is accomplished by the wedges when the spigot end of the pipe is deflected laterally against them, thus forcing the bottom ends of wedges up the slope and backward against the jute and lead. This internal calking of the joint prevents leakage.



SECTION SHOWING NEW TYPE OF CAST IRON PIPE JOINT

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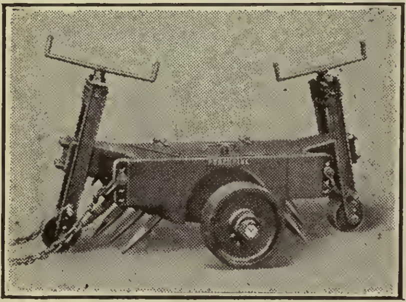

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VOLUME XXIII
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SEPTEMBER, 1920

The Water-Supplies of the Panama Canal

By George C. Bunker

Sanitary Engineer, Balboa Heights, C. Z.

THE importance of the water-supplies of the Canal Zone cannot be judged by the size and output of their purification plants. A true international aspect is given to the purification of these supplies because the Panama Canal furnishes water to vessels of various nationalities which sail on the Atlantic and Pacific oceans, to the cosmopolitan passenger movement to and fro across the Isthmus to the residents of the cities of Colon and Panama in the Republic of Panama, and to its employes.

Three purification plants are in service for supplying filtered and disinfected water for domestic and industrial consumption: first, to the cities of Panama and Colon in the Republic of Panama; second, to the communities of employes of the Panama Canal at Cristobal, Mt. Hope, Gatun, Paraiso, Pedro Miguel, Balboa, Balboa Heights and Ancon; and, third, to the military and naval forces at the various posts in the Canal Zone. This represents a total combined population of approximately 110,000, of which 108,550, or 98.4 per cent, are provided with filtered and disinfected water. Part of the 1,700 people of which the above 1.6 per cent is composed are provided with condensed or distilled water, so that it may be assumed that approximately 1,200 per-

AERATION BASIN AT MIRAFLORES FILTER PLANT, CANAL ZONE
Head house, settling basin and filter house are seen at center and left. Miraflores Locks and emergency dams are shown at right

sons drink unfiltered water from various sources.

The Miraflores Plant

The Miraflores purification plant, located opposite the Miraflores Locks, on the east side of the Canal, was placed in operation in March, 1915, and supplies filtered and disinfected water to Paraiso, Pedro Miguel, Corozal, Balboa, Balboa Heights and Ancon in the Canal Zone, and the city of Panama. The raw water is pumped to the plant from an intake in the Chagres River, close to the bridge which crosses the river at Gamboa, through 11.3 miles of 30- and 36-inch cast iron pipe. This river is 65 miles long and has a drainage basin of 559 square miles. The pumps lift the water from lake level, varying from 80 to 87 feet above sea level, to the top of the Continental Divide at elevation 271, from which point it flows by gravity to the plant.

The capacity of the plant is 17,000,000 gallons per day, and the average daily outflow during the fiscal year of 1919 was 9,371,000 gallons. The filtered and disinfected water flows by gravity to a pump station at Balboa, from which it is pumped to a low-service reservoir holding 1,000,000 gallons, and a high-service reservoir, holding 2,500,000 gallons, both of which are used as surge tanks.

The plant consists of the following units: an aeration basin, 86 by 130 feet in plan, equipped with 105 spraying nozzles; a head house containing three baffled mixing chambers of the under- and over-flow type, alum storage space, solution tanks, and a bacteriological laboratory; three cross-connected, parallel, concrete sedimentation basins, with a total capacity of 4,500,000 gallons, measuring 300 by 125 feet in plan by 17 feet deep, each of which contains two solid baffle walls in which there are five rectangular openings near the top; a filter box into which the settled water flows; a filter building containing 14 rapid sand filters of the gravity type, with a combined filtering area of 5,950 square feet, and an office and laboratory; a 900,000-gallon clear-water well under this building; a 300,000-gallon concrete wash-water tank from which the plant Pedro Miguel and Paraiso are supplied; a small concrete building for housing duplicate chlorinators; and a pump station in which there are pumps for filling the wash-water tank and an air compressor for air washing the filters.

In place of the usual ridge block and pipe systems of underdrainage there is a reinforced concrete false bottom, 12 inches thick, which forms the top of a pressure chamber 2 feet deep. In the false bottom there are placed 1,677 vertical ⅜-inch brass feed pipes, spaced 6 inches center to center. The ends of the pipes projecting above the false bottom are bent 180 degrees, so that the wash water instead of discharging upward is deflected upon the floor or gravel. These are the first filters constructed with reinforced concrete false bottoms, and the first five years of operation have demonstrated that this type of underdraining system effectively washes the sand and gravel at a low cost of maintenance. During the first fiscal year of 1919 the filter runs averaged 32 hours and the wash water 2.85 per cent.

The Mt. Hope Plant

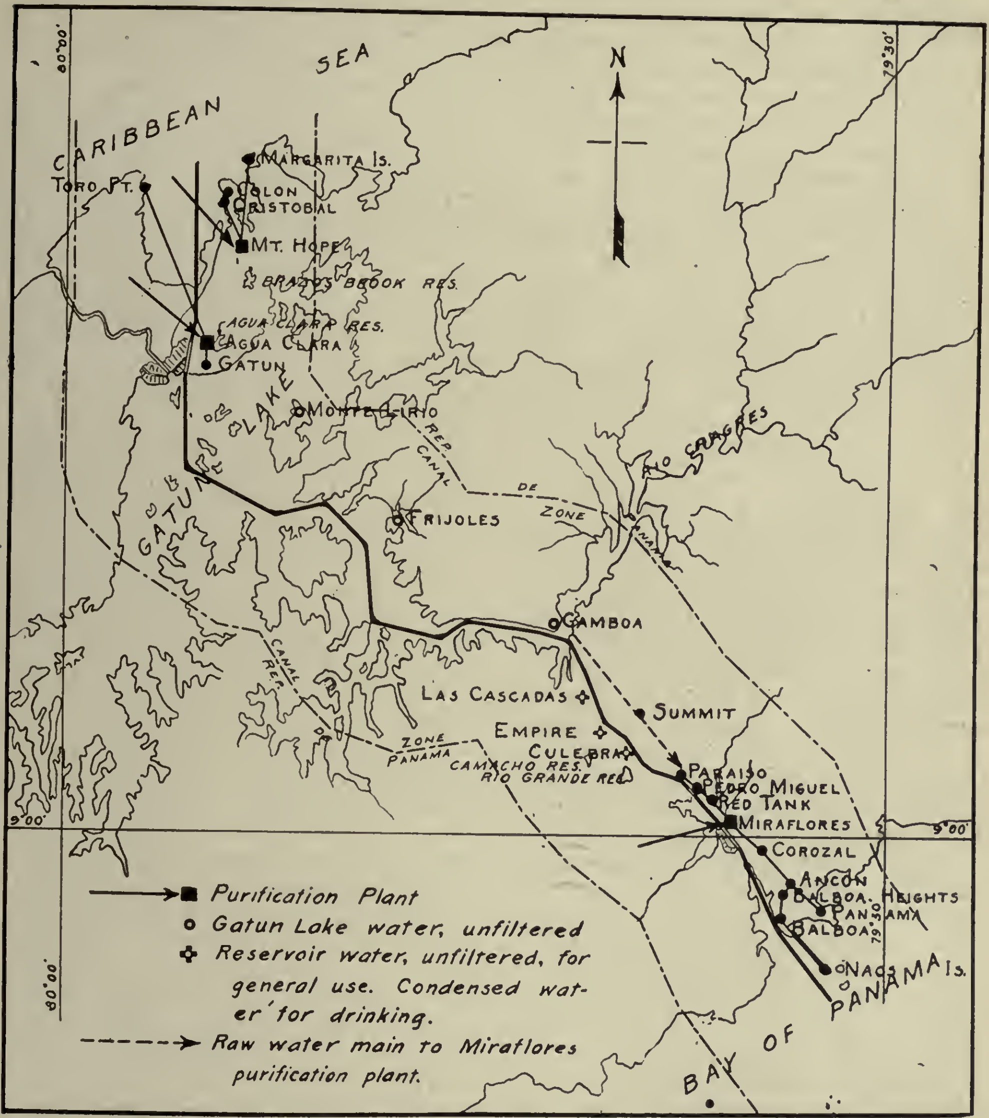
The Mt. Hope plant, located at Mt. Hope on the road to Gatun, was placed in service in February, 1914, and supplies filtered and disinfected water to Colon, Cristobal, Margarita Point and Mt. Hope. The raw-water supply flows by gravity from Brazos Brook Reservoir, with a storage capacity of 650,000,000 gallons, located 1¼ miles southeast of the plant.

The capacity of this plant is 8,000,000 gallons per day, and the average daily outflow during the fiscal year of 1919 was 4,515,000 gallons, which increased to 6,091,000 gallons during the last ten months of the last fiscal year. Adjacent to the plant there is a pump station from which the filtered and disinfected water is pumped directly into the distribution system of the district supplied by this plant.

The Agua Clara Plant

The Agua Clara plant, located 1.8 miles northeast of the Panama Railroad Station at Gatun, but close to the main highway between Colon and Gatun, was placed in service in December, 1911. It supplies filtered and disinfected water to the Gatun District and Toro Point. The raw-water supply flows by gravity from an impounded reservoir, 470 feet east of the plant, which has a maximum storage capacity of 612,000,000 gallons and a watershed area of 1,019 acres.

The capacity of this plant is 2,500,000 gallons per day, and the average daily out-



MAP SHOWING LOCATION OF WATER SUPPLIES OF THE PANAMA CANAL

flow during the fiscal year of 1919 was 1,164,000 gallons. Adjacent to the plant there is a pump station from which the filtered and disinfected water is pumped directly into the distribution system and a 340,000-gallon concrete reservoir.

The general design of the Mt. Hope plant is similar to the one at Miraflores. The Agua Clara plant was built without any provision for aeration, but on the recommendation of the writer a wooden box aerator, 4 by 8 feet in plan by 4 feet deep, patterned after those in use at South Norwalk, Conn., the bottom of which is perforated with ¼-inch holes spaced on 1-inch centers, was placed in service in August, 1916. Practically four years of service have been obtained from this box, which makes the cost of aerating an average of 1,000,000 gallons of water per day very low. In other respects this plant is similar to the other two plants, with the exception that it is neither so well arranged nor equipped.

Aeration

Aeration is a very essential feature of

water purification in tropical countries, not only for taking care of odors produced by algae but for removing those of fermentation and putrefaction. It has been found at the Mt. Hope and Agua Clara plants that a marked increase in the length of the filter runs and a decrease in the amount of wash water have been effected by introducing the alum prior to aeration, which will remove about 75 per cent of the carbon dioxide liberated by the reaction of this chemical with the alkalinity of the water. There is a direct relation between the length of filter runs and the amount of carbon dioxide in the settled water applied to the filters, other conditions being the same.

Contrary to the writer's expectations when he first entered the tropics, comparatively little trouble has been experienced with disagreeable tastes and odors in the supplies of the three plants due to algae. At times when odors of any noticeable intensity developed, the aeration successfully removed them, and it has never been necessary to apply copper sulphate to the Brazos Brook and Agua Clara reservoirs to eliminate odor- and taste-producing organisms. In the case of the Camacho reservoir, the copper sulphate treatment has been used several times to remove excessive growths of anabaena and chlamydomonas, because this supply of water is not filtered prior to its entrance into the distribution system.

Effects of Microscopic Organizms

The miscroscopic organisms have a marked influence on the length of the filter runs. This has been noticed especially at the Miraflores plant. The longest runs, of 141 hours, are obtained in the flood periods of the Chagres River during the rainy seasons. As the turbidity of the raw water decreases after the floods, the microscopic organisms start to increase again in numbers and the filter runs start to shorten. The shortest runs, 15 hours, occur during the dry season. At this plant it has been found that an increase in the amount of alum will effect a partial removal of the organisms in the settling basins and increase the length of the filter runs.

The copper sulphate treatment has been used successfully at Brazos Brook and Agua Clara reservoirs to reduce the numbers of certain organisms which were influencing the length of the filter runs, but the writer is of the opinion that no great saving is effected through the treatment when its cost is balanced against the amount of wash water saved. During 1915, when pressure filters were in use in a small plant in Ancon, the water-supply being derived from Miraflores Lake, extremely sudden and large growths of diatoms would develop, with the result that in a few hours the filters would be plugged tight and large quantities of wash water would have to be used until the effects of the copper sulphate treatment would relieve the situation for a few days.

Chemical Characteristics of Waters

The following table shows some of the chemical characteristics of the raw-water supplies of the three plants during the fiscal year ended June 30, 1919:

	Parts Per Million		
	Mt. Hope	Agua Clara	Miraflores
Color	18.00	23.00	11.00
Turbidity	13.00	8.00	4.00
Alkalinity	39.00	17.00	53.00
Hardness, soap	40.00	15.8	47.00
Oxygen consumed	2.6	2.9	1.00
Chlorine	6.00	6.8	6.6
Iron	0.23	0.47	0.25
Solids, total	79.00	62.00	112.00

The color, turbidity and iron are easily removed from the raw-water supplies of the Mt. Hope and Miraflores plants by moderate amounts of alum—182 and 132 pounds per million gallons, respectively. There has been considerable variation in the chemical characteristics of the raw-water supply of the Agua Clara plant during the last five years, which renders the treatment of this water more difficult and expensive. For example, the solids have varied from 53 to 86 parts, the alkalinity from 13 to 21 parts, the soap hardness from 6.3 to 26 parts, the iron content from 0.30 to 3.00 parts, the color from 10 to 152 parts, the turbidity from 6 to 46 parts, and the oxygen consumed from 1.55 to 9.8 parts.

In his report for the fiscal year ended June 30, 1916, the writer stated that:

> "The continual low alkalinity of the raw-water supply of this plant, 14 to 20 parts per million, with the amount of alum necessary for the removal of the color, which has varied from 30 to 110 parts during the fiscal year, have produced conditions such that it was considered advisable and necessary to increase the alkalinity and decrease the amount of free carbonic acid in the fitered water by the addition of soda ash or lime. The application of the former was started in the early part of February. The use of settled water with zero

alkalinity and, at times, an alum acidity, caused a shortening of the filter runs to about four hours, a cementing together of the sand, with the formation of hard spots in the filters, a marked corrosive action on service pipes, and —most important of all—a harmful physiological effect."

After numerous laboratory experiments, it was decided to introduce lime into the partially decolorized and clarified raw water as it passed from one compartment of the settling basin to the other. This method of treatment, with the addition of the alum to the raw water just before the latter entered the box aerator, was continued until April, 1920. During this period the alum varied from 110 to 409 pounds, and the lime from 26 to 329 pounds per million gallons.

In April of this year, on account of the increase in color in the raw water to 132 parts and in iron to 2.45 parts per million and the accompanying increase in alum, it became necessary to supply artificial alkalinity to the raw water prior to the addition of the alum in order to obtain the proper "floc" and color removal. Because of the difficulties of handling and applying the lime solution in the quantities necessary with the facilities at hand and the small difference in cost between lime and soda ash, it was decided to use the latter, introducing it about 200 feet ahead of the alum. The addition of the lime to the settled water is continued, however, in order to absorb the free carbonic acid, increase the alkalinity of the filtered water and lengthen the filter runs.

At the present time, with a color of 152 parts, an iron content of 2.2 parts, a turbidity of 28 parts, and an alkalinity of 24 parts per million in the reservoir water, it is necessary to use 544 pounds of alum, 75 pounds of soda ash and 81 pounds of lime per million gallons of water to obtain a filtered water with 5 parts of color, 0.1 part of iron, 29 parts of alkalinity, and no turbidity.

Chlorination

At each of the three plants there is a chlorinator for disinfecting the filtered water. During the month of April, 1920, chlorine was applied to the plants at Miraflores, Mt. Hope and Agua Clara at the respective rates of 3.1, 3.0 and 2.4 pounds per million gallons. The disinfected water from each of the purification plants conform to the bacteriological standards of the U. S. Treasury Department. The monthly reports of the daily examinations of water samples as made up by the writer are submitted each month to the Chief Health Officer of the Panama Canal for examination and approval.

A resident superintendent, a graduate from either a sanitary engineering or sanitary chemistry course, operates each plant and makes daily routine chemical and bacteriological examinations of the water passing through the plant and the distribution system. At the Miraflores plant there are well-equipped testing laboratories for the examination of road materials, general analytical work, and research work in connection with the purification of water.

Impounding Reservoirs

There are four impounding reservoirs in the Canal Zone which are used in water-supplies. Two have been mentioned, Agua Clara and Brazos Brook, while the other two, known as Camacho and Rio Grande, with respective storage capacities of 283,510,000 and 400,000,000 gallons, are the sources of the water-supply for communities on the west side of the Canal, Culebra, Empire and Las Cascadas. The waters from these reservoirs are not filtered, but since the days of construction condensed water has been furnished to the people residing on this side of the Canal for drinking purposes.

The watersheds of the reservoirs are uninhabited and are policed to prevent trespassing. The maintenance gangs are provided with sanitary buckets, which are emptied, at the end of each day's work, into pits or buried outside the limits of the watershed. While free from pollution of human origin, the reservoirs are subject to pollution from the large numbers of wild animals in the jungle growth. Without going into this matter in detail, it is sufficient to state that the sum total of the pollution thus introduced directly and indirectly into the waters of the reservoirs is of considerable magnitude.

Stagnation and putrefaction of the volumes of water in the reservoirs below average depths of 13 feet have been responsible for more complaints from consumers and the distribution of water of poor quality, from the standpoint of appearance and chemical composition, than any other factors in the water-supply system of the Panama Canal. Stagnant layers of the water with high color and iron contents and disagreeable odors are frequently found 10 feet below the surface of some of the reservoirs, and at times even closer. In the writer's opinion it is absolutely necessary in the tropics to install an adjustable intake in place of a series of fixed intakes so that water may be drawn from any desired elevation.

All reservoirs in the tropics should be provided with blow-off valves in order to waste the bottom stagnant layers of water after heavy rains rather than to allow the fresh run-off to waste over the spillway. The present poor quality of water in Agua Clara reservoir is due to the non-removal of the stagnant bottom water during the last rainy season on account of the liability of injuring construction work.

A caretaker at each reservoir directs the work of a maintenance gang, which cuts the grass around the shore line, cleans the beds of the feeders, clears off the brush and trees growing along the feeders and the shore line of the reservoir proper, and takes care of the miscellaneous work which arises from time to time. Daily records of the rainfall and elevation of water are kept.

Cost of Water Purification

The costs of furnishing filtered and disinfected water during the fiscal year ending June 30, 1919, were as follows:

COST OF WATER PER 1,000 GALLONS

	Gatun System	Colon-Cristobal System	Pedro Miguel-Ancon-Balboa System
Operation of raw water pump station			$0.0155
Operation of filtered water pump station..	$0.0419	$0.0184	0.0137
Operation of purification plant	0.0240	0.0135	0.0198
Maintenance of reservoir	0.0304	0.0133	
Maintenance of mains..	0.0155	0.0312	0.0276
Total	0.0118	0.0764	0.0766

Water is sold to vessels at the docks at Balboa and Cristobal at 50 cents per 1,000 gallons, with a minimum charge of $3. In the cities of Colon and Panama water is sold only through meters, of which there are about 971 in the former and 2,431 in the latter city.

The following table contains certain statistics regarding the consumption and cost of water in the cities of Colon and Panama:

	Colon	Panama
Population	26,078	61,369
Average daily consumption, gals.	1,367,800	2,541,000
Average daily consumption per capita, gallons	52	41
Average quarterly consumption for private connection, gallons.	60,250	67,536
Number of private connections or meters	971	2.431
Average private quarterly bill..	$27.98	$15.52
Rate per 1,000 gallons.........	0.45	0.30
Discount on quarterly bills within 16 days, per 1,000 gallons..	0.05	0.05

The Municipal Engineering Division, under the direction of D. E. Wright, Municipal Engineer, operates the water-works and receives credit for the cost value of water furnished other departments and divisions of the Panama Canal, the Panama Railroad, the Panamanian Government, other departments of the U. S. Government, and individuals and companies.

Has Your City Seen These Exhibits?

The American Federation of Arts has constantly on tour some forty traveling exhibitions of many kinds, paintings, sculpture, engravings, industrial arts, photographs, textiles, wall paper, prints for home decoration, etc., etc., selected by experts. These reach all parts of the country, having made 150 stops this year. It also circulates illustrated lectures, prepared by authoritative writers, museum curators, painters, sculptors and other qualified persons.

The Federation works for better art education, uniform art legislation, establishment of competent art commissions; it supplies art information and study courses. It has thrown its weight in favor of the rapidly growing movement toward industrial arts design worthy of the stamp "Made in the U. S. A."

RICHARD F. BACH, Extension Secretary,
The American Federation of Arts,
The Metropolitan Museum of Art, New York City.

Genuine Savings Through Municipal Ownership

The Story of the Holyoke, Mass., Municipal Plants

By John J. Kirkpatrick
Municipal Manager, Gas and Electric Department

THE city of Holyoke, Mass., has been successfully operating its gas and electric plants for more than seventeen years, having taken over the plants of the Holyoke Water Power Company in 1902. All of the machinery that was in the electric plant when it was taken by the city has since been discarded, except the water wheels, and none of the old gas plant is now in use except the gas holders, the pipe shop and the office building.

The two plants cost the city $815,000 in 1902. Now they have a book value of nearly $2,000,000, although the bonds still outstanding exceed the amount originally issued by only about $160,000. In 1903 the output of the electric station was about 1,300,000 k.w.; in 1919 the output was nearly 20,000,000 k.w. The amount of gas manufactured in 1903 was 99,600,000 cubic feet; this figure had increased to 276,862,000 in 1919.

The gas works is equipped with two water gas sets having a capacity of 1,200,000 cubic feet per day. The coal gas plant employs the Woodhall-Duckham system of vertical retorts. From the coal gas, residuals of coke tar and ammonia are obtained and from the water gas one residual, water gas tar, is derived. These residual by-products net the city an appreciable sum each year, amounting in 1919 to $24,431.23,

A BATTERY OF BOILERS IN THE POWER PLANT OF THE HOLYOKE MUNICIPAL GAS AND ELECTRIC PLANT a sum exceeding, for example, the amount spent under the heading of "general salaries."

At the electric station the steam generating equipment consists of one 4,000-k.w. Westinghouse turbine, two 2,500-k.w. and one 1,250-k.w. General Electric turbines. Steam is provided by eight Babcock & Wilcox boilers, with superheaters of 400 h.p. each.

There is a small hydro-electric plant operated in connection with the electric station, water for which is drawn from the first level canal (owned by the Holyoke Water Power Company and discharged through four 250-h.p. wheels into the second level canal. The water power is what is known locally as non-permanent power, generally termed surplus power. Under the terms of the lease with the Power Company, the city has the right to draw 16 non-permanent mill powers of water from the canal and pay to the company a rental of $5 per day per mill-power when the water is available. A mill-power in Holyoke is the right to draw 38 cubic feet of water per second under 20 feet head. The water is available on an average of about nine months of the year, and is very unreliable during six of the nine months. Many times the water is available for only part of the day. On short notice the station is deprived of its use, sometimes for days, and even months. Because of its unreliability, it is considered of little if any value to the plant. About 22 per cent of the energy generated during the last seventeen years was from water power; the balance, about 78 per cent, was generated by the steam turbine.

A remarkable feature of the operation of the plant is reflected in the cost of street lighting for the period covered by municipal operation. Under Massachusetts laws, municipal plants are required to sell both gas and electricity at cost to the municipality owning the plants. Consequently, the city of Holyoke paid less for street lighting in 1919 under municipal ownership than it paid in 1902 under private ownership, notwithstanding the fact that there were four times as many street lights in 1919 as in 1902. In discussing the relative advantages of municipal and private operation of utility plants, the fact that a municipally owned utility pays no taxes is often advanced as an argument against municipal ownership. This argument is answered in Holyoke. It is generally conceded that the prices paid for street lights in Holyoke are among the lowest, if not the lowest, in Massachusetts. If the city of Hoyoke had paid to the Gas and Electric Department during the past sixteen years the lowest prices that any city or town in the state paid for metered electricity in buildings and for street lights, then the city would have paid $453,745 more than it actually did pay for such purposes. If the Department had paid taxes during these years it would have paid $358,134. The difference between these amounts is $95,611 and it represents the loss to the Department because it was not permitted to pay taxes and to charge the city at the going rate for the gas and electricity it uses. Therefore, the Department figures that it has not only paid the equivalent of taxes, but nearly $100,000 more than its share of the taxes.

These figures demonstrate that the plant saves money for the municipality. It also saves money for the individual citizens. The following tables show the relative costs of gas and electricity in typical Massachusetts cities.

CHARGES FOR GAS

	Per Thousand Cubic Feet
Springfield	$1.45
Worcester	1.50
Cambridge	1.60
Boston	1.60
Pittsfield	1.80
Westfield (municipal)	1.80
Northampton	1.80

Holyoke has charged $1.20 up to July 1, 1920, on which date it was found necessary to raise the rate to $1.60 with a minimum charge of 50 cents per month. The figures for electricity are even more favorable:

	Per K.W.H.
Chicopee	$.09
Westfield	.09
Springfield	.10
Worcester	.09
Boston	.10

The rate in Holyoke has been $.06 per k.w.h. since the year 1906, with minimum charge of 50 cents per month.

The Annual Report of the Gas and Electric Department is profitable and interesting reading for the citizens of Holyoke, who follow the activities of their city government. The Holyoke report differs from the reports issued by many other cities, in that one does not have to be a certified public accountant in order to understand it. The statements of costs and profits are simply

GENERATOR SETS OF THE MUNICIPAL ELECTRIC PLANT, HOLYOKE, MASS.

and clearly made, sufficiently itemized to be satisfactory, but without such a mass of detail as to be confusing. It is an account rendered to the citizens of the municipality, prepared in such a way that its contents can be readily grasped by everyone. When the taxpayer reads the annual report for 1919, with the tables showing the mounting costs for a period of half a dozen preceding years, he needs little other argument to reconcile him to the increased gas rate or the minimum charge on both gas and electricity. When he looks over the table showing the savings value of the commercial by-products extracted in the manufacture of gas, he feels reassured that the plant is run under the same principles of economy with which he manages his own business enterprises or conducts his household. He has confidence in the Department, because he has been allowed to understand its workings.

With the expansion of Holyoke, both the gas works and the electric station have nearly reached the ultimate capacity of the sites upon which they are located. The city has already taken measures to secure larger sites, upon which will be erected a new electric station and an extension to the gas works.

A Commendable Private Gift for Public Service

In appreciation of the excellent work of the local fire department of Madison, N. J., which saved a number of buildings on Geralda Farm when fire destroyed a barn and threatened the other structures, Mrs. Marcellus Hartley Dodge has presented the borough with a new motor-driven fire engine. The contract for the purchase was signed less than ten days after the fire, and full power of selection was given to Fire Chief B. C. Philhower, who carefully studied a number of different types of engines. The new motor equipment of the latest type will have a capacity of 1,200 gallons a minute and is much larger than the motor engine now in use, which the department has had since 1911.

Appraising Public Utility Properties

Final Determination of Value for Rate-Fixing is a Governmental Rather Than An Engineering Function

By Delos F. Wilcox

NEW JERSEY is a state of original ideas; at least it has recently given birth to a new thought in valuation procedure. By chapter 351 of the laws of 1920, the so-called Allen Act for the valuation of street railways, the Legislature has by-passed the State Utilities Board entirely, and has adopted a simple, short-cut method for the performance by contract of what has hitherto been regarded as one of the most difficult and inescapable functions of government. The success of this experiment would usher in a millennium for all the parties, or possibly for all but one of them. The commissions would be spared the intolerable toil of thought. The engineers would see their calling and election sure. The companies would be relieved of their constant dread that the regulatory body may unhappily develop too great an interest in the ratepayers' point of view. The public—well, the public is supposed to be generous and to be able to satisfy itself by contemplation of the benefits that accrue to the other parties.

The Allen Act in effect removes the whole problem of street railway valuations from the jurisdiction of the Utilities Board. It provides that three state officers, the governor, the state treasurer and the state comptroller shall act as a commission to procure a valuation of the property of any or all street railway and traction companies in the state, and appropriates a fund of $100,000 for the project.

The new Commission is "authorized and directed to immediately select, by a majority of all of its members, a competent electrical or mechanical engineering concern, either firm or corporate, of the highest established reputation, equipped and organized for and experienced in the work of valuing street railway property." The Commission is further authorized and directed to enter into a contract with the engineering concern so selected to make and complete as soon as possible a valuation of all the property of any street railway or traction company which the Commission may designate. The act provides that the engineering concern selected by the Commission is to proceed immediately with its work and is to have access to the property and records of the company concerned, and also to have the use of all documents, records and testimony in the possession or custody of any commission, board or department of the state or of any political subdivision of the state. The Valuation Commission is authorized to agree with the engineering concern upon the amount of compensation to be paid for its services and expenses and also to decide upon the time to be allowed for the valuation of the property.

Section 9 of the act is the one that represents New Jersey's new idea born out of political wedlock. It is a prodigy.

> "When the valuation of the property of any street railway or traction company is completed as herein directed, the engineering concern so selected to make such valuation shall file with the Commission herein constituted a complete and detailed report of such valuation in form available for use for the purpose of fixing rates under existing laws, which report, together with all documents and maps, and other papers accompanying same shall be immediately transmitted to and filed with the Board of Public Utility Commissioners of this state, and shall be a public record, open to the inspection of the public at all reasonable times, *and shall be admitted as evidence in the courts of this state and shall be evidence of the facts therein contained to the same extent as though the same had been produced and proved and the value of the property as set forth in said report shall be accepted by the Board of Public Utility Commissioners of this state as the value of said property as of the date specified in said report in any rate proceeding under any law of this state to the extent that the value of said property is a factor in the fixing of a rate.*"

This law, if it be a law, is based upon the fallacious assumption that the fair value of a public utility property for rate purposes is a *fact* which can be ascertained by any firm of experienced and competent engineers, whereas the truth is that the determination of the value of such a property is not an engineering but a governmental function, and depends upon the weighing of a great number of different facts by a body clothed with governmental power and governmental responsibility. In the Public Service Railway rate proceeding which was referred to, the municipalities analyzed the Cooley valuation and after making certain adjustments and corrections of method, contended that the fair present value of the property for rate purposes was less than $60,000,000, while a Stone & Webster man, produced on behalf of the company, figured out a value of $180,000,000, and another engineer, formerly with H. M. Byllesby & Company, stopped at $165,000,000.

This wide range in the estimates of value presented by various witnesses before the Utilities Board is accounted for, primarily, by differences in their theories of valuation. It is one of the fundamental functions of courts and public service commissions, before which testimony in rate cases is taken, to weigh all of the evidence; take into consideration all of the pertinent and proven facts; decide what are the correct and legal rules in the application of the several methods of appraisal, and finally determine, on the basis of all these factors, what, in their judgment, is the fair present value for rate purposes of the property devoted to the public service in the case before them. The legal basis of valuation for rate purposes was originally set forth by Mr. Justice Harlan, speaking for the United States Supreme Court, in the case of Smyth v. Ames twenty years ago, in the following words:

> "We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."

Is it not clear that the determination of the fair value for rate purposes of the property of a public utility is a governmental function of the highest type? It would be no more radical a departure from established governmental procedure if Congress, wearying of the delay on the part of the Interstate Commerce Commission in completing the valuation of the railroads of the United States undertaken some years ago, should pass an act naming an executive commission of three men and direct them to enter into a contract with some engineering firm to make a valuation of the railroads of the United States, with the provision that when the valuation was completed and nicely bound up in a volume, it should be delivered to the executive commission and by that commission transmitted, without examination to the Interstate Commerce Commission, and thereafter should be accepted by the Interstate Commerce Commission as the basis for rate-fixing, and, without proof, should be evidence in all the courts of the United States of the facts which it purported to find. Under the New Jersey act, the determination of value will be the determination of an engineering concern hired to perform a public function without supervision, without responsibility, without public hearings, and even without testimony or an opportunity for the cross-examination of witnesses.

Forsooth, we are entering upon a new era of simplicity in valuation work and the regulation of public utility rates. The New Jersey Legislature has found a way to cut the Gordian knot. The only trouble with it is that if, by any chance, the engineering concern selected to make the valuation should be persona non grata to the Public Service Railway Company, or if, after the work is completed and the state's money spent, the result should be displeasing to the company, then the valuation by the engineering concern will not be worth the paper it is written on, for a public utility company could surely protect itself against the invasion of its rights by a procedure so obviously at variance with "due process of law." Whether the public has any protection against adverse results under **this fantastic measure remains to be seen.**

Can Fire Department Trucks Be Utilized for Snow Removal?

By Harry R. Hayes
Consulting Engineer, Utica, N. Y.

A MUNICIPAL problem which yearly attracts more official and public notice is that of snow removal. A few years ago this subject was given serious consideration by only the larger cities, where unusual congestion of traffic caused very disastrous results. It is not many years ago that snow conditions were met in only one way, and that by operating equipment designed for winter use, and the question of the removal of the snow itself was considered a work of an extravagant nature. In those days even the fire apparatus was equipped with sleigh runners for winter use, and it was only the railway companies in the average-sized cities which directed any activity towards the work of snow removal.

In later years, however, large investments have been made in motor equipment, municipalities have discarded horse-drawn apparatus and have adopted motor equipment for fire purposes, and, in fact, ordinary business concerns have installed motor equipment for almost every delivery purpose, so that to-day any slight street congestion caused by snow conditions not only retards transportation in the commercial and manufacturing field but also seriously affects the prompt and efficient operation of motorized fire equipment and disrupts the important work of garbage and refuse collection and removal. There is also a marked increase in the winter use of automobiles for business and pleasure. There is need for extended snow removal work in order to afford parking space for passenger vehicles. The business men in the store districts show a strong desire to have the streets kept cleared of snow during the winter for business reasons. They realize the necessity more each year for clean and uncongested streets both in summer and in winter. It is also generally recognized that the more work that is directed on snow removal the less ice there will be to remove, and the less amount of street cleaning there will be to do in the early spring.

Conceding, therefore, the importance of snow removal and winter street cleaning work, a municipality should adopt a systematic means of its accomplishment. The aim of a municipality should be, first, to open and maintain open for vehicular traffic the main arteries; second, to clear the snow from the congested districts as rapidly as possible; third, to remove the snow from the side streets after the main streets are cleared; and, fourth, to keep the streets in the business section as clean as possible. These four aims can be realized by properly planning the work sufficiently far ahead for easy execution.

During a winter of very mild weather snow removal and street cleaning is comparatively a simple problem. It is important, however, that the city should be as prepared as possible to meet any emergency. In ordinary cities the two departments which are expected to shoulder the responsibility of this work are the Public Works and the Public Safety departments. These two departments should be organized so that mobilization could be effected as early as may be needed for snow removal work. In addition to the organization feature, there is also the important necessity of providing the proper equipment, and of utilizing it to the best advantage by the proper organization.

The labor market is a factor which must always be considered. It has been found when snow removal work has been planned to be operated only by the use of labor and teams, that in years when the labor market is scarce considerable delay is experienced in organizing the snow removal forces, and that in times of severe storms none but the strongest type of labor could work, and a very large percentage of this class would not work until the conditions had moderated. These and other facts have caused officials to devote time and study to improving upon methods of snow removal and endeavor to develop a system which would relieve congestion as readily as possible and one which would not be so very largely dependent upon labor.

How the Plan Would Work

Municipalities are largely discarding horse-drawn apparatus and investing vast sums of money in motorized fire equipment. Such apparatus is located in fire-houses in different parts of every city, and it would seem feasible to equip each piece of apparatus with an adjustable snow-plow and assign to each fire-house a certain district to operate. The most effective way to undertake snow removal work and to fight a snow storm is to commence operations before the storm has subsided, and the fire department would be the best agency to utilize for such such purposes. The fire department can be quickly assembled and could very early commence to operate. The snow-plows, being adjustable, could be attached in the fall and are so arranged that they could be used when needed. The fire-plows would be operating while the snow was falling and could easily keep the streets open.

It would be the duty of the fire department to keep the streets in each district cleared during the winter. The Department of Public Works should be assigned the actual work of removing the snow, and in case of an extended snowfall this force could be augmented by teams and men and also by utilizing the equipment and forces used in the work of ash and garbage removal. The plow work of the fire department on the wide streets would easily keep such streets clear, and therefore in the business district the snow removal forces of the Public Works Department should be first directed to the narrow streets, particularly the street car streets.

This plan provides for the simultaneous operation of two snow-fighting forces, namely, the plow force of the fire department, engaged in the early stage of the storm in keeping the wide streets open for traffic, and the removal force of the Public Works Department, to be first engaged on the actual removal work on the narrow congested main streets. After these congested streets have been relieved by the public work forces they could be directed to the streets which had been cleared by the plow forces of the fire department, in the order of their importance. The motor equipment of the Public Works Department could also be provided with plows, and in addition it might be of advantage to install one or more of the modern rotary snow-plows which have recently been designed for practical use on such work.

It is also possible that in many places sewers might be utilized for the disposal of the snow and also for the purpose of clearing up street intersections. A study of the local sewer situation would show which manholes could be used. Actual experiments have developed the conditions under which the sewers might be utilized for snow disposal, and consideration must be given to this point.

It might at first be thought that the utilization of the fire equipment for snow-removal work would interfere with its operation for fire purposes. The plow attachment would not have such an effect, as it can be raised or lowered as may be needed. I am also confident that it would be easy to arrange a plan whereby the department could be easily assembled for a fire call even when actually engaged on snow removal work. There are many ways in which the fire signals could be easily transmitted. There may be other objections which would prove the plan to be entirely impracticable, but it is offered for the discussion of a problem the solution of which must provide for the early mobilization of a properly equipped snow-fighting force and the maintenance of a properly organized snow-removal force.

Resurfacing Worn Brick Roads

In addition to sheet asphalt topping of old brick roads, another practice now in vogue, meeting with very good results, is to bring the old brick road to an even surface by patching or resetting the brick. The patching consists of thoroughly cleaning the rutted portions, giving the side of the hole or depression a paint coat of asphalt, and then filling it with stone of suitable size, which have already been covered or mixed with asphaltic material. After the rut has been properly tamped down and allowed to set, the whole surface of the street is treated with an application of asphaltic material at the rate of 4/10- to ½-gallon to the square yard, and covered with ½-inch chips to the extent of 50 to 60 pounds to the square yard. This creates a new road surface of splendid qualities, requiring a minimum of maintenance.

A City Proud of Its Water Waste

Chicago Publishes Booklet Boasting of Its High Per Capita Consumption

MUNICIPAL advertising carried out by a carefully arranged program is a wholesome method for aiding the growth of a municipality. Great care, however, should be exercised in choosing the various elements which are to be advertised. The city of Chicago has recently issued a booklet bearing on its cover the statement, "Boost Chicago. We Pump More Pure Water Than Any City on Earth and at a Lower Cost." This booklet between its covers contains many interesting data with regard to the water-supply of the city. If the statement on the cover had been chosen with greater care, this would be a valuable booklet for distribution among manufacturers and prospective residents who would consider locating in the city on account of the excellence of its water-supply. But, when the City Engineering Department has been working for years to secure a reduction in the water wasted, and the city faces the present necessity of enlarging its water-supply at a cost estimated at $60,000,000, such boasts are untimely.

In 1917, the Chicago Bureau of Public Efficiency carefully studied the waterworks situation and recommended universal metering as a means of checking the then gigantic waste of water, which has grown in the last three years.

When it is appreciated that costs of fuel, steel and the other materials used in pumping stations have vastly increased since 1917, the following paragraph from the report of the Bureau of Public Efficiency is of interest:

> "Besides its ruinous effect upon service, the transportation of the large volume of water lost through waste and leakage means a serious financial loss. There is an abundance of water in the lake and, of course, the water itself is free, but the city is in the business of transporting it from the lake to the premises of consumers, and its transportation costs money. During 1916 it cost more than $1,000,000 just to pump water which is often regarded as free. It takes as much labor, coal, other supplies and equipment to pump water into the sewers or into the ground as it does to furnish it for a useful purpose.
>
> "The financial loss results in two ways. Enormous expenditures are required for equipment which otherwise would not be needed. Moreover, more pumps and boilers must be operated and maintained. This means increasing the cost of the pumping station labor, fuel, supplies and repairs. It is now costing about $500,000 a year to pump water which is later wasted or which leaks away. In 1916, 190,000 tons of coal, valued at $450,000, were consumed in the Chicago pumping stations. One-half of this amount was used to pump water that was wasted. In view of the problems now involved in mining and transporting coal and of the resulting need for conserving its use, the necessity for preventing water waste, and hence fuel waste, is becoming more and more urgent."

On June 25, 1917, the City Council passed an ordinance providing that "meters may be installed upon service pipes found supplying leaks, waste or unauthorized extensive or unusual use of water" and providing that at the discretion of the Commissioner of Public Works "said meters may be removed * * * when cause for installation is corrected." This ordinance was designed to strike at the waste evil by the partial metering method, but to be successful, partial metering must be accompanied by persistent house-to-house inspection for the purpose of locating leaks.

Every city to-day should sell its water-supply to the consumer by meter and in this way reduce the waste which is so prevalent in many American cities. We believe there are few cities in a class with Chicago which care to boast of their gigantic per capita consumption of 240 gallons per day with a peak load running over 300 gallons per day per capita.

Filter and Chlorinate Your Water Supply

Filtration of public water supplies is necessary to produce a clear and palatable water. Chlorination is necessary to destroy the bacterial life which may have passed through the filters and which may cause disease. Many supplies that are now chlorinated should also be filtered and all filtered supplies should be chlorinated.

Plan for Corner Cut-Offs on City Streets to Secure Greater Safety

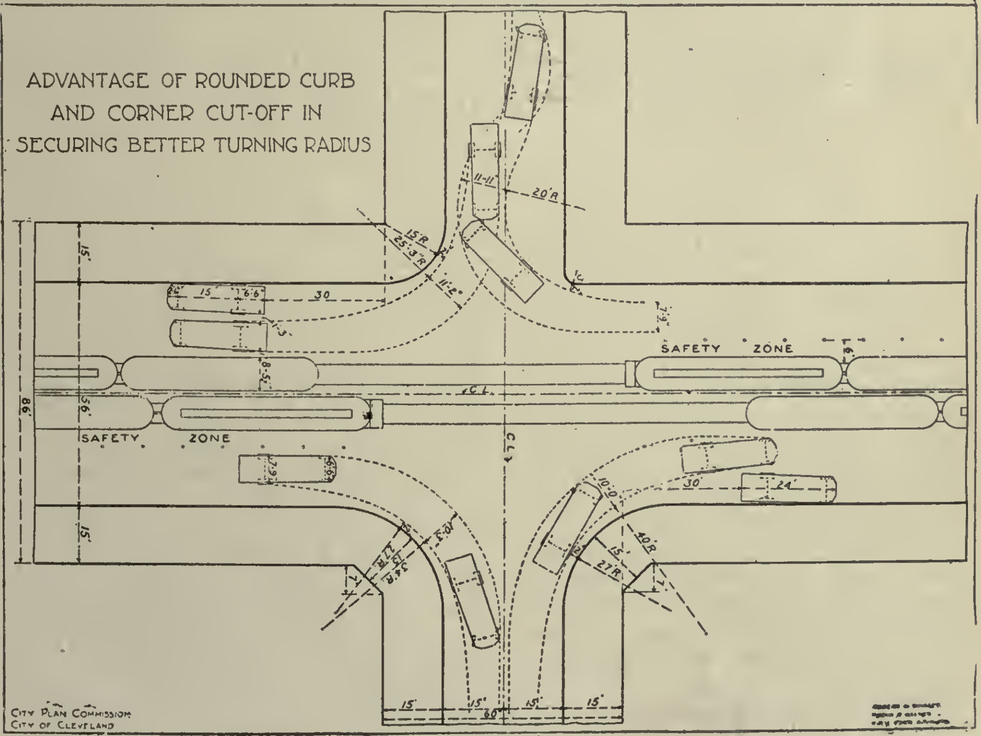
By Robert H. Whitten
Advisor, Cleveland City Plan Commission

In laying out or widening thoroughfares provision should, as a rule, be made for street corner cut-offs so as to secure a greater turning radius for vehicles and an increased angle of vision.

The greater the turning radius at a street intersection, the smaller the danger of collision through swinging over on the left-hand side of the narrow cross-street. Even large trucks can turn on a 20-foot radius, but they seldom do so. Accidents are frequent from trucks and other vehicles swinging too far to the left in rounding corners. Without a corner cut-off the curbs could be rounded on a 15-foot radius without encroaching on the normal sidewalk space. By cutting back the corners at the street line the curbs can easily be rounded on a 27-foot radius. This gives a normal turning radius of 34 feet to 40 feet. In order, however, that advantage may be taken of the larger possible turning radius, it will be necessary to prohibit parking within 30 feet of the corner.

The wider the angle of vision at a traffic intersection, the greater the chance to stop in time to avoid collision. The wider the angle of vision, therefore, the greater the speed that can be safely maintained in approaching an intersection. This wider angle of vision can be secured either by widening the street or by cutting back the corners. Where increased street width is not needed, the cutting back of the corners is by far the more economical method of securing a wider angle of vision.

That a 5- or 10-foot cut-off does not normally decrease the rental value of a retail store, office or apartment building is shown by the number of such buildings erected without legal requirement. Such a cut-off normally furnishes the most eco-



nomical and desirable location for the entrance to a store, and a good location for display windows on both the first and second floors. Windows located on this cut-off have the advantage of looking down two streets. In addition to their business value they are, therefore, in demand for either office or apartment purposes.

ENTRANCE TO MT. GREENWOOD CEMETERY, MORGAN PARK, NEAR CHICAGO

The Planning and Maintenance of Modern Park Cemeteries

By Lucy Lowe

THE tendency in this country to-day is toward the naturalistic or parklike cemetery, as contrasted with the very formal cemetery of early days. There are many examples of such treatment throughout the country and they are increasing yearly. The ablest landscape architects are making it their business to familiarize themselves with the elements of cemetery design. No longer are the areas plotted off into so many sections, and monuments erected helter-skelter without any regard for fitness and beauty. Almost every cemetery in the country, large and small, now has rules and regulations governing the placing of markers and monuments.

The cemetery, formerly the most unattractive and depressing spot in the whole community, the most shunned section of the city, except when necessity demanded attendance there, is coming into its own as a beauty spot. The ugly, sinuous roads and drives are giving place to gracefully winding roads and paths planted with trees, and laid out in such a way as best to serve the convenience of the lot owners. The old time spotty planting is giving place to the carefully planned arrangement of planting material with an eye to enhancing the attractiveness of the grounds. We find this new note in cemetery design being taken up by cities all over the country. One of the most beautiful cemeteries in the country is the famous Mt. Greenwood Cemetery at Morgan Park, just outside of Chicago. It is a fine example of what a modern cemetery should be. Cemetery experts are learning to take advantage of site. Mount Greenwood happens to be located on land which is about the highest near Chicago and was originally covered with a dense growth of white and burr oaks, most of which have

MT. GREENWOOD CEMETERY IS ADORNED WITH FINE TREES

been retained. It has the advantage of being rolling ground, an ideal location for a park cemetery, and it is not likely that the city will encroach upon it.

One of the greatest factors in increasing the attractiveness of modern cemeteries and burial grounds has been the enforcement of rules and regulations governing the planting and the use of monuments. Most of the newer cemeteries and many of the older ones have recognized the wisdom of limiting the lot owner's choice, and in order to make a perfect whole, have kept the control of plant material in their own hands. The rules usually provide that no planting may be done without the consent of the association, and that under no circumstances may planting be removed without their permission. The same ruling applies to monuments, certain sections being sold with the understanding that no monuments are to be erected therein. Another improvement is the change in the drive system. It is customary now to make the drives no wider than necessary on the main roads, and to have a system of loops for the minor drives, whereby traffic can be carried through the cemetery without collision but without wasting space.

The up-keep of the modern cemetery is due to the perpetual care system. Perpetual care is the result of putting the cemetery on a paying basis. The modern cemetery is a business proposition. Take, for instance, Mount Greenwood Cemetery's system. This association since 1910 has been selling lots with the guarantee of perpetual care without additional charge. It has been able to do this because it is sound financially. Its funds are secured by following the plan outlined: 20 per cent of the price of all lots sold, 20 per cent of the price of all single graves sold, 20 per cent of all interment charges, and 20 per cent of all charges for monument and headstone foundations are invested with other trust funds and the interest compounded. Each year this is increasing, and very soon the fund will reach the half-million mark, thus insuring a financial backing. There is no danger of this cemetery's losing its high standing among the associations as one of the best equipped and best cared for in this country.

The associations in charge of cemeteries are rapidly coming to learn that beauty is an asset, that the cemetery which can give an assurance of up-keep is the one that is going to sell lots—and, as in most undertakings, the aim is to make it pay. The cemetery of to-day often covers acres. Its size demands care in location and layout. This is the function of the landscape architect and the city planner, and they are meeting the demand for such service.

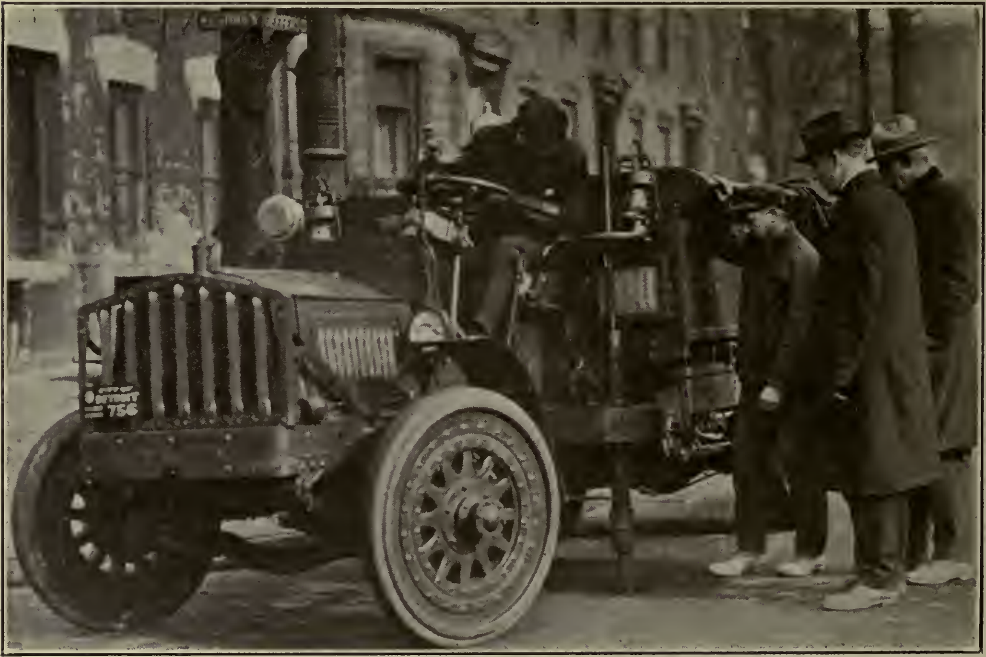
A Truck Equipped to Operate Large Valves

DETROIT, MICH., is keeping up with the modern idea that machinery should replace hand labor wherever possible. Among the 83 Packard motor trucks owned by Detroit is one equipped with a device for opening and closing the gates in the huge water-mains by power. As shown in the picture, the truck is driven so that the shaft is directly over the valve. If the valve is reached through a small opening, this is easy; if it is reached through the manhole, an arm, which is fastened on a pivot just back of the left front fender, is swung around in position, and a pointer, which is fastened to this arm, is brought directly over the valve on one hole. The pointer is then removed, and a shaft, shaped to fit the valve on one end and the drive-shaft on the other end, is placed in position on the valve.

By means of the hand wheel, shown on the screw in the picture, the operator screws the drive-shaft down until it connects with the auxiliary shaft. A lever meshes a gear in the driving mechanism of the gate-closing device with a gear in the transmission, and upon letting the clutch in, the motor is connected and the gates are easily and speedily closed.

In the body of the truck are four large lockers containing all the necessary equipment, such as blocks, wrenches and tools of various kinds, rubber coats and rubber boots, gas-masks, and a book of blue-prints showing where all the gates are located and the kind and size. Just back of the driver's seat at the left hand side is a chart showing the number of turns required to close or open each different kind of gate. When the connection is made with the gate valve, the driver, whose motor is running, connects the gears of the transmission with the gears of the gate-closing mechanism and lets the clutch in.

An automatic counter registers each turn of the shaft, and when it registers the required number of turns for that particular kind of valve, the driver immediately disengages his clutch. This outfit is very valuable in winter, though little used in summer.



OPENING A LARGE VALVE IN A WATER MAIN, DETROIT, MICH.

An Administration of Municipal Water-Works

The Success of Operation Under Boards of Trustees

EVERY municipal water department should be conducted as a separate "administrative entity" and should be entirely separated from the general city government. Such a policy necessitates the conferring of broad and extensive powers upon the administrative body, such as are usually exercised by a private corporation engaged in supplying water for public uses.

The division of authority between the body administering the water plant and the officers conducting the general city government has not proved workable and does not contribute to efficiency in either department. The business of supplying water when conducted by a municipality is first and always only a business and should be managed and conducted solely as a business, not for the purpose of obtaining the largest possible revenue, but to attain the greatest possible efficiency and to supply, at a moderate charge, all public requirements. Being a business, questions of general public policy and civic improvement, ethical and moral laws and regulations find no proper place in the operation of a water system. The persons chosen for constructing and operating a municipal water plant should be chosen for their technical knowledge of the particular enterprise which is to be committed to their charge. Knowledge of the broader questions of municipal government in no way qualifies individuals with the technical knowledge to successfully operate a water-works system.

An attempt to operate the water system as a distinct part or branch of a general scheme of municipal government, whether that government be conducted by a political body elected in the manner generally prevailing throughout the United States, or by commissioners under some modification of the city management plan, will usually fail of achieving the efficiency which otherwise would be obtainable, for the reason that general city officers, or the officers conducting the general city government, are chosen from time to time upon issues involving questions of ethics and morality and the general policy of the government which have no relation whatever to the business of managing the water system. Upon such issues the people divide and give effect to the particular policy or scheme of municipal government which, for the moment, is the most popular. The experience of the candidates for city offices in conducting a "business" enterprise forms no part of the general debate and is not passed upon by the city electorate in choosing officers. From the very nature and fundamentals of the usual city administrative body, the officers chosen by the people to conduct the general city government rarely possess technical knowledge or experience in any given line of business. This results in loss to those branches of the municipal government which are purely "business" in their nature.

The reasons briefly outlined led the municipality of Clarksburg, W. Va., to take steps to separate entirely the construction and management of its water-works plant and system from the general scheme of the municipal government and to place it under the control of a governing body to be chosen solely because of their qualifications to conduct that particular business. A vote cast in selecting a member of the administrative body which controls the water-works system does not in any way reflect the sentiments of the voters on ethical and moral questions or questions of general public policy in the administration of the general city government. The choice is based entirely upon the qualifications of the party voted for, to conduct that one particular business. The result of this scheme is that experts possessing technical and general knowledge of the subject are placed in charge of an enterprise that is of a strictly business character, and a degree of efficiency is obtained in administering the particular business which has not generally prevailed in municipal governments throughout the country.

Excerpts from Clarksburg, W. Va., Charter

The Clarksburg, W. Va., Water Board, herein created when this act goes into effect, shall supersede the water-works and sewage board created by Chapter XII of the Acts of the West Virginia Legislature, Session 1909. The Water Board shall at its first meeting, or as soon as practicable thereafter, appoint a General Manager for the water-works plant and system of the city. The General Manager shall act as Secretary for the Water Board, and shall be treasurer of the Water Board. Said Board shall have the power to employ such hydraulic engineers, mechanical engineers, and other technical experts, attorneys, assistants, agents or other employes as they shall at any time deem necessary for the good of the public service. They may create, fill and discontinue employments other than those herein prescribed, according to their judgment of the needs of the department.

Department of water-works shall be "an administrative entity" separated from the general city government and administered by the Water Board, elected for a term of three years.

In order to prevent the pollution of the waters from which the people of the city take water for domestic uses, the jurisdiction of the Water Board shall be coextensive with the location and extent of the waters from which such supply is taken, except that in no event shall such jurisdiction exist within any other incorporated city or town.

Power of Eminent Domain.—The Water Board as herein created shall have the right under the power of eminent domain to condemn, acquire and appropriate any property and acquire the fee simple title or any lesser estate or easement therein for any public use, whether said property be located within or outside of the corporate limits of said city, including the right to acquire property for the construction and maintenance of sewer lines, sewage disposal plants, water lines and mains, pump stations, reservoirs or reservoir sites, dams for storing water, and the right to create storage reservoirs by flooding adjacent properties, and for every other purpose required in the construction, maintenance and operation of water systems and plants for the purpose of supplying water to the public. The proceedings to acquire such lands, estates, or easements shall be the same as provided by general laws of the state of West Virginia for condemning and appropriating private property for a public use.

The Water Board is empowered to fix, regulate and change rates and charges for water supplied to all consumers, and to adopt and prescribe rules and regulations which shall be observed and obeyed by all consumers in reference to the use and consumption of water taken from city mains; the terms and conditions upon which connection to the said mains shall be permitted, and the place and manner of making the same; to fix penalties by way of additional charges for failure to pay water rents promptly, and to this end may discontinue the supply of water of any consumer who fails to pay for the same as required; to require all users of water for temporary purposes to pay for the privilege in advance; to refuse to furnish water to any building or habitation in the city unless the owner thereof shall assume liability for the payment of the charges for the water so furnished; to charge the cost of installing water service lines from the curb line to the mains against the landowner, and to require the payment in advance for installing such line and making connection with the water main; whenever the City Council shall determine to pave or repave any street, the Water Board is authorized to make a proper connection and lay a water service line from the main to the curb for each and every lot or for any part of a lot under separate ownership, although no water service may at the time be necessary or required for any such lot or part of lot, and to charge the cost of making such connection and laying such water service line against the owner of the property, and the cost of laying such water service lines and making such connections shall in every instance be a lien upon the lot or part of lot to be benefited thereby, and the Water Board shall have the right in the name of the city to institute and prosecute any proper suit in the circuit court of Harrison County, W. Va., for the collection of such charges by a sale of the property on which the same constitutes a lien.

Plumbers are required to pass examination and obtain certificates of competency. The city may require all persons who engage in the business of plumbing to pass an examination and obtain a license or certificate for such purpose. For this purpose there is hereby created a board of examiners of four persons to consist of the Superintendent of Public Welfare and the General Manager of the Water Board and of two other persons selected by them, one of whom shall be a master plumber and the other a journeyman plumber. The license shall be for such term or period as may be prescribed by the examining board. The Superintendent of the Department of Public Welfare and the General Manager of the Water Board shall not receive any compensation for serving on the board of examiners, but the additional members shall be entitled to a sum not exceeding $5 a day for each day of actual service, to be paid out of the funds of the Water Board. The General Manager of the Water Board shall be ex-officio secretary of the board of examiners, and he shall make out and certify, and the Superintendent of the Department of Public Welfare shall countersign all certificates of licenses, and said secretary shall keep and preserve all papers and records relating to the work of said board. The board shall be governed by any ordinance in force in the existing city of Clarksburg when this act goes into effect, or which may be passed by the Water Board.

A Success in Iowa

An increasing number of cities are placing the management of their water-works under a board of trustees of three or more men, who receive a nominal remuneration and usually serve for periods of about six years, one new member of the board being elected every two years. This scheme insures continuity of policy and takes the management out of the hands of politicians, and at all times there is at least one member of the board who knows the past policies and future prospects. Such a board exists in Ottumwa, Iowa, where it has produced great satisfaction. The Commission has been able to keep politics entirely out of the water-works, and each succeeding administration has been true to the precedent that was first set. The Commission is handling the business efficiently, has had in its employ for a number of years a good engineer, and has generally acted on his advice, especially in all technical matters. The Commission has all routine power, but in cases of special expenditures the Council must take the final action.

In Cedar Rapids, Iowa, the actual management and operation of the water-works—pumping and station and office—are carried on distinctly separate from all other city departments. The Board collects its own returns, pays its own bills, purchases its own supplies and keeps a separate bank account in the name of the "City Water Works." At the end of each week a check is turned over to the City Treasurer to cover whatever is in the bank and then a warrant is drawn against him for the payment of all bills, and the City Treasurer in turn keeps the water-works funds separate from other city money. This is a much more satisfactory method of handling the department than could possibly be arranged were it in the hands of the Mayor and Council, for, with an election held every two years, there are a great many appointments made solely for political reasons, regardless of whether the appointees are qualified to fill the office for which they are named or not—in which latter case the department always suffers.

The Situation in Mason City

The Chamber of Commerce of Mason City, Iowa, has been working for almost a year in an endeavor to secure a Board of Trustees for the operation of its municipal water-works. A petition with a number of names was circulated and handed to the City Council. The Council delayed making a canvass of the petition to see that it had been properly signed by qualified electors of the city, because they were opposed to giving the people an opportunity to express themselves on this question. Late this spring, however, when the City Council learned that it would be necessary to get the endorsement of the voters of the city for a bond issue of $300,000, the assistance of the Chamber of Commerce was sought in putting over the election, with the promise that if this assistance was forthcoming, an election for a Board of Trustees would be called at any time the Chamber of Commerce committee requested it.

Accordingly, the bond issue was placed before the people at the time of the election on June 7, 1919, and was carried. Very soon thereafter, July 27 was set as a date for a second election for the bond issue. At this time, the Council did not consult the Chamber of Commerce, figuring that the election could be carried without assistance, but when the committee learned this it insisted that an election for a Board of Trustees be held at the same time as the election for the bond. This was agreed upon, and the Chamber of Commerce undertook to create sentiment in favor of both propositions. The utmost publicity was given, and the city was thoroughly organized in each ward and precinct. Checkers were provided in each of the polling places, and automobiles worked during the entire day to bring out the votes. The result was: for the bonds 1,473, against the bonds 155; for the trustees 1,053, against the trustees 584. The proposition to have a Board of Trustees for the management and control of the water-works carried, while the bond issue failed to carry in spite of the large majority in favor of it. The law stipulated that in order to carry a bond issue of this kind, a majority of those who voted at the last general election must be in favor of it. This required a total vote of 1,651 in favor of the bonds, which was not accomplished.

If the proper men are appointed on the Board of Trustees, it is altogether probable that another election will be called, so that a bond issue can be carried. Many business men did not vote for the bonds because they did not know who would spend the money. The proceeds of the bonds were to be used for new improvements and additions to the water-works systems.

The Waco Water-Works

The municipally owned water-works of Waco, Texas, are maintained and controlled by a Board of five Water Commissioners. The charter provides that no two of them shall be from the same ward of the city, and they are elected by the voters at large and serve without remuneration. Further, these Commissioners are ineligible to hold any remunerative office in the Water Department while a member of the Commission, or within one year after the term of office of two years. In Waco, two members are elected at one election and three the following year. The Board has complete charge of the management, maintenance, improvements, extensions and enlargements of the water-supply, either within or outside of the limits of the city, and it can acquire by purchase, donation or condemnation, suitable grounds, water privileges, rights of way and other property rights and privileges necessary for the efficient operation of the plant.

The Board is empowered to fix water rates, providing that the rates shall be sufficient only to raise in any one year an amount equal to one year's interest on all water-works bonds issued by the city and to defray all of the operating and incidental expenses and depreciation on the plant. The Superintendent of Water-Works and the Secretary are elected by the Board. All money due the Water Department is collected by the Secretary of Water-Works and deposited with the City Treasurer, and credited to an account "The Water-Works Fund of the City of Waco." All payments are made as a draft on this fund.

The Management of Denver's Plant

The water-works of Denver, Colo., are administered by a Board of Water Commissioners of five members, created by an election held August 6, 1918. The amendment to the charter which was approved by the voters at the above election created a non-political Board of Water Commissioners of five members to have complete charge and control of the water-works system and plant supplying the city and county of Denver with water. The amendment carried with it the election of five members for varying terms and stipulated that on the second Monday in June, 1919, and each two years thereafter, the Mayor shall appoint one or two commissioners, as the case may be, for terms of six years each to succeed those whose terms expire. The Commissioners each receive a salary of $600 per year and are required to give a bond in the sum of $5,000. A fine of $25 is imposed on any member of the Board who is absent from a regular meeting except on business of the Board, and when a member of the Board is absent from three successive regular meetings, unless excused on account of sickness or other unavoidable reasons, to be determined by the Board, he ceases to be a member of the Board and his case is filled by appointment as in the case of other vacancies. The Board is given complete charge of the operation of the management of the water-works, holding property in the name of the city and county of Denver.

The charter provides that the entire cost of the operation and maintenance of the water-works system and plant, including the salaries of the Board and its employes, and extensions, additions and betterments, shall be paid from the water-works fund. No indebtedness created by the Board in any year can be a charge against the revenue for any succeeding year, and further provision is made that no money shall be expended from the revenues of the water-works for additions, extensions and betterments in any year until maintenance, operation and interest charges for the current year have been provided for. This clause is probably one of the reasons for the unfortunate condition of affairs in Denver at present, as the water-works is in financial straits.

The method of appointment of commissioners as stated above is such that it is possible for a mayor whose term of office is four years to change the membership of the Board of Water Commissioners so that a majority of the Board will be appointed by him. Under present conditions, three members will be appointed in the term of the present mayor, three during the term of his successor, and four members of the Board during the term beginning June 1, 1927, and ending May 31, 1931.

In Kitchener, Ontario, Canada

A Board of Water Commissioners, composed of four men, elected by the vote of the people for two years, two being elected each year, has complete control of the water-works of Kitchener, Ontario, Canada. The Mayor is also a member of the Board. Politics has practically nothing to do with the election of the Commissioners. Of the four present Commissioners, three have been members for long terms, one since 1899. The Board has practically the same power as the City Council, except that it cannot hold property in its own name, all deeds being held in the name of the city. Because of this, any debenture issues must first pass the City Council, but they have no control over expenditures. The Commissioners serve without salary. They hold regular monthly meetings and occasional special meetings.

The Chance of Fire

Ninety-one cities of the United States reported for their cities the number of fires for each 100 buildings in 1919. The average for these 91 cities is 2.86 fires per 100 buildings. If these fires were all in separate buildings, it would indicate a fire in every 36th building once each year. However, since these fires are concentrated to some extent in industrial and mercantile occupancies, it is safe to assume that among the aerage occupancies of this kind there is a fire each year in the 25th or 30th building housing them. The man who invests his money in fire protective devices for guarding occupancies of this kind is not taking a very long chance on the possibility of using them over a period of a few years.

—*Fire Protection,* June, 1920.

Resurfacing An Asphalt Block Pavement in Sarnia, Canada

By R. L. Dunsmore

Assistant City Engineer, Sarnia, Ontario

THE question of resurfacing the asphalt block pavements in Sarnia became a problem in 1918, when the condition of the streets with this type of pavement became so bad that some immediate action was imperative.

During the years 1904 to 1908 approximately 58,000 square yards of asphalt block pavement was laid. This consisted of a 3-inch asphalt block laid on a cement mortar cushion and a 5-inch concrete base. The specifications called for the cushion to be cement mortar, one part cement to three parts sand, and the base to be one part cement to six parts river gravel hand mixed. The blocks were supplied by the Ontario Asphalt Block Company, and the pavements were guaranteed for ten years by the contractor.

In 1915 the pavement stood in great need of repairs. The city decided that the remedy lay in giving the blocks a carpet coat of some mixture. Accordingly, a contract was let for the resurfacing of a portion of the block pavement with Dollorway. This consisted in covering the existing pavement with a skin coat of a tar preparation and crushed stone chips. The contract price was 35 cents per square yard, and the skin coat was guaranteed for two years.

This Dollorway, while giving the road a smooth surface, began to chip off and disintegrate at the end of one year, and the contractor had to repair it during the second year. Nothing further was done to repair the pavement until 1918.

In 1918 the City Engineer, J. A. Baird, reported that 5,070 square yards of the pavement was unfit for traffic. As a result of this report the matter of permanent repairs for the pavement was resumed. A report on the pavement was made by the Paving Department of the Milton Hersey Company, Limited.

The following is the report on the test on one of the blocks:

		Result of Tests of Sample	Model Mixture	Min. Specifications	Max. Specifications	Totals
Bitumen		7.8%	10	8	12	
Passing	Held on					
200	mesh	16.3%	10	7	14	Not less than
100	200	5.2%	9			
80	100	0.5%	9	7	25	18
50	80	3.0%	16	3	25	11 to
40	50	3.3%	7	3	18	36
30	40	4.7%	6	3	14	7
20	30	7.8%	4	3	9	to
10	20	17.7%	2	2	6	25
4	10	29.0%	18	11	25	20 to
2	4	4.7%	9	4	10	35
Mesh	2					
Totals		100.0%	100			

NOTE.—Figures give percentage by weight.

Penetration of asphalt cement—hard.

The second way of repairing the pavement—that of removing the asphalt blocks and laying a new top—is merely a matter of choosing the sort of surface best suited to the conditions in hand. No block pavements of any sort were considered. Penetration macadam or sheet asphalt was then to be chosen. The former proved to be cheaper than the latter. The company which afterwards did the work quoted $1.70 per square yard for the one as against $1.92 per square yard for the other, in June, 1918. However, the City Engineer of Sarnia chose the sheet asphalt.

His reasons were these: the greater permanency; and the better surface, which suited the local conditions in that the streets are wide and the grades flat, and because the street carries very heavy city traffic, being the main artery of the city and nearly half of the pavement having a track allowance in the center of the street.

Specifications were drawn up calling for the removal and disposal of the asphalt blocks; the removal of such portions of the concrete base as in the opinion of the City Engineer was not sufficiently strong to carry the sheet asphalt; a new base laid in such spots; the laying of a close binder course

1½ inches thick above the normal surface of the concrete base; and a surface course 1½ inches thick on the top of the binder course.

On the removal of the blocks, several stretches of the concrete base were in such poor condition that it was necessary to tear out the old concrete and lay a new base.

The binder course was quite similar to a bitulithic pavement. It was rolled first with the tandem roller and given its final compression with a 12-ton roller, which forced it well down into any hollows in the base.

The noteworthy points brought out by this report are the low percentage of bitumen, its hardness, and the low percentages of aggregate passing the 100- and held on the 200-mesh sieve. The latter do not compare at all favorably with the report of the model stone-filled mixture, which represents a good asphalt block mixture laid in sheet form.

The Hersey report of an inspection of the pavement showed that practically all of it was badly and very unevenly worn, rendering patching impractical, for any new blocks inserted would stand higher than the old ones. In less worn areas the blocks were worn along their edges, producing a rough surface at best. Also, if all the blocks that were worn more than 20 per cent were replaced, the resulting surface would be too rough for a city street. These defects were other than those caused by a defective concrete base.

Sarnia being a small city and having no paving equipment of its own, and especially after both the pavement itself and the skin coat had proved failures, the City Engineer determined to spare no effort in securing the most exhaustive information from all sources on the subject of resurfacing block pavements.

Among those consulted were the Ontario Department of Highways, which sent a representative to Sarnia, who went over the proposition thoroughly, Mr. Gray, the Roadway Engineer for the Imperial Oil, Limited, A. Proctor, asphalt expert for the city of Detroit, The Milton Hersey Company, Limited, of Montreal.

There are two general methods for the repair of asphalt block pavements, each of which may be subdivided:

1. Laying a new surface on top of the asphalt block
   (a) A skin or carpet coat over the whole surface
   (b) The disintegrated surface of the blocks removed by a surface burner, and a 2-inch course of sheet asphalt laid

2. The blocks removed and an entirely new surface laid on the concrete base
   (a) Sheet asphalt
   (b) Bituminous or penetration macadam
   (c) Vitrified or wooden blocks, etc.

The skin or carpet coat may be applied in various ways. The city of Stratford has had much the same experience with asphalt blocks as Sarnia. The method used there was to bring the whole surface of the street to a common level by filling all holes and worn spots in the pavement with Tarvia X; then a carpet coat of Tarvia B was laid over the entire street. At the time of writing, this is giving good service, but it has not been in place sufficiently long to assure its permanence.

The second method of resurfacing the asphalt blocks is more generally advised than the first. The whole pavement is gone over with a burner or surface heater, a portion of the blocks being scraped up and the surface of the remainder softened. While the surface is still hot, a 2-inch coat of hot mix asphalt is applied in the ordinary manner. This method has been used to some considerable extent by the city of Toronto, but, as in the case of Stratford's experiments, this resurfacing has not been in place long enough to insure that it is a reasonably permanent remedy.

The difficulty with these methods is that in general practice not only are many asphalt block streets pot-holes, which makes it impossible to apply a 1-inch surface, making in reality a much heavier surface over the entire pavement, but the blocks are deteriorated throughout, being extremely porous on the side next the concrete base. This means that the vitality of the block is gone, and it is foolish to spend money trying to build a new surface on it.

So this method of resurfacing the blocks has been set aside as being too problematical a remedy to try again.

Where it was necessary to increase the crown of the road, the extra thickness was made up with the binder course. The surface laid on the binder was Standard sheet asphalt, the following being the mix specified:

Passing	Held on	Result of Tests of Sample Submitted	Model Mixture	Min. Specifications	Max. Specifications	Totals
Bitumen		12.1%	12	10	14	
200	mesh	14.3%	13	10	20	Not less
100	200	18.6%	13			than
80	100	11.8%	13	10	35	25
50	80	25.4%	23	4	35	15 to
40	50	7.6%	10	4	25	50
30	40	4.6%	8	4	20	10
20	30	2.4%	5	4	12	to
10	20	3.0%	3	2	8	35
Mesh	10	0.2%				
Totals		100.0%	100			

NOTE.—Figures give percentage by weight.

A large number of the old blocks were carted away by citizens and used for driveways, walks, etc., but though at the time it seemed as if a lot of good material was being thrown away, there has been no regret expressed or felt at the course advised and carried out by the City Engineer.

Summing Up Street Perils

A Warning from the Record of Newark, N. J.

THE danger which constantly exists in the streets of Newark, menacing human life and safety, is pictured vividly enough in the figures of the statistical compilation which the Police Department has completed showing the number and kind of vehicular accidents occurring in the four years immediately preceding 1920.

During that period 5,702 persons were injured in the streets in vehicular accidents, and 362 of these died in consequence of injuries sustained. That makes an average of four injured every day throughout the four years and of 1 death in every 16 persons hurt.

The saddest thing about it is that conditions as to the unsafety of the streets seem to be growing worse instead of better. There were 1,711 injured last year, an average of nearly five a day and an excess of nearly 500 over the record of 1916, notwithstanding changes that were supposed to be improvements in the handling of street traffic, warnings from the judges of the courts, indictments and convictions, punishment of offenders, revocation of automobile licenses, safety campaigns and the constant hammering of the press at practices that contribute to the evil. The list was longer last year than in 1918. The tabulations have not yet been brought down to date, but there seems to be ground for belief that, unless there is a change for the better, 1920's record will be longer than any yet.

It is interesting, though not surprising, to note that automobiles figured in the largest number of accidents, and these contributed about fifty-five per cent of the whole number of street accident victims. Of 999 motor vehicle accidents in 1919, passenger cars figured in 612, commercial cars in 229, jitneys in 99, taxis in 14 and motorcycles in 45. There were fewer trolley than jitney accidents last year, while the reverse was true the preceding year.

In the four years covered by the survey, 423 were injured by jitneys and 396 by trolleys. The cars figured in more fatal accidents than did the busses, the score for last year being 11 deaths from trolleys and 5 from jitneys, and for the four years 44 from trolleys and 27 from jitneys. Railroad accidents within the city limits appear to be on the decline, and mishaps in which horse-drawn vehicles figure also show a gradual reduction. Next to automobiles, collisions, separately classified, contribute to the greatest number of injuries, although the death rate attending this class of accident is very low, 8 deaths resulting last year in a total of 548 injured.

One of the most significant of the summaries of the compilation is that relating to responsibility. It appears that in the largest number of cases the person injured was found to have been responsible for his misfortune. In 4,408 cases studied, it was found that in 2,654 the injured person was at fault, while in 1,754 instances—just 900 less—the responsibility was upon the driver of the vehicle. The moral of this revelation is that carelessness is an undesirable quality that is found in no one class and most frequently reacts harmfully to those who display it.

— An editorial from the *Newark News*.

Road Construction Problems in Wyoming

Data from State Highway Department Show that Wyoming is Taking Vast Strides to Open Up the State by Well-Planned Road Construction

ALTHOUGH Wyoming's Highway Department as now operating has been organized only since March 1, 1919, there are under way road and bridge projects totalling $4,500,000 which are scheduled for completion during the current construction season, and the end of the season will witness a total of $6,000,000 in road projects under way and completed.

The area of the state of Wyoming comprises approximately 98,000 square miles, with an average population of 1½ persons per square mile. Of the total area of the state, the United States Government still retains title to slightly over 63 per cent. There is in use in the state approximately 16,000 miles of roads and trails.

Of the total road mileage above, it is the plan of the State Highway Department to designate and maintain as the state highway system an approximate total of 2,000 miles of roads by January 1, 1921. Approximately 800 miles of this amount is now under construction. The remaining mileage will be reconstructed with heavy grading machinery this season, and permanent patrol maintenance will be established over the entire proposed system.

Types of Roads

Wyoming is building three types of roads, namely, earth, gravel or shale surfaced, and permanent surface of cement concrete and Warrenite. Earth surface is specified where traffic is light or the road material available is such that construction under proper maintenance will care for the light traffic existing at present or to be expected in the future under normal conditions. For earth roads, the same care is used in location and laying grade lines as is exercised in laying out the more important highways. This type usually has a road width of 20 feet with a "V" ditch 1 foot deep by 4 feet wide and a raise of crown of 9 inches. Surface ditches, drainage and outlet ditches are provided to completely handle all water. The maximum grade used is 7 per cent, with no curves sharper than 28 degrees.

During the course of construction of earth roads, contractors are permitted to use machines of either the blade or elevator type, but are required to produce a road-bed of the grade and cross-section specified in the plans. When elevators or scrapers are used, contractors are required to leave a berm of 5 feet on each side of the roadway between the toe of the slope and the borrow-pits. All earth work is paid for by the cubic yard on an embankment basis, which also includes clearing and grubbing for road-bed and borrow-pits.

Drainage Structures

Standard-type drainage structures are used on all classes of construction, comprising galvanized corrugated iron pipe, reinforced concrete boxes and reinforced concrete bridges of the T-beam type. On earth roads all structures are designed to carry a load of 10 tons, and have a roadway width of 16 feet. Steel bridges are sometimes used where the span required exceeds 50 feet and the nature of the stream requires a clear span.

All corrugated iron pipe used is of open hearth steel of 16-gauge metal for pipe 15 and 18 inches in diameter, and of 14-gauge metal for pipe of 24 inches diameter and greater. No pipe of a smaller diameter than 15 inches or larger diameter than 36 inches is used. Galvanizing specifications require not less than 2 ounces of pure spelter per square foot, evenly distributed.

For drainage areas requiring a larger opening than afforded by two 36-inch pipes, concrete box type culverts up to 15-foot span, and 10 feet in height are used. A structure with gravity walls and reinforced slab top, with stream-bed left unimpaired, has proved to be a very economical type.

Reinforced concrete bridges can be built in Wyoming at a cost approximating 10 per cent less than steel structures of the same span width. Gravel surfacing of 4 inches depth is used to protect the slab floor of concrete structures from direct wear.

Road Surfacing

Gravel and shale surfacing is used, where the local materials are not sufficient to care for the traffic needs. Gravel or shale

A 20-TON HOLT TRACTOR OWNED BY THE WYOMING STATE HIGHWAY DEPARTMENT CROSSING THE BELL FOURCHE RIVER

The amount of earth moved in one operation can be plainly seen in the rear of the second grader. This equipment has been used for grading and reconstructing earth and gravel surfaced roads, and is one of the most economical outfits in the Department.

is placed on the more important roads, which have a roadway of 24 feet between ditches and a rise to crown of 7½ inches. Specifications require a width of surfacing of 15 feet with an average thickness of 6 inches, placed on a level subgrade. The construction of the earth shoulders, either before or after the placing of the surfacing material, is optional with contractors.

Gravel surfacing is specified of such size as to all pass a 2½-inch ring and not less than 50 per cent be retained on a ¼-inch screen, and to contain between 20 and 30 per cent of clay, shale or other binder.

The same percentage of clay, loam or silt for binder is allowed in shale surfacing.

Surfacing material is laid in one course and dragged daily until compacted by traffic any unevenness which may develop while the road is being compacted is taken care of by adding material or by scarifying and reshaping. Payments to contractors are made on the basis of the number of cubic yards of surfacing material in place plus an additional sum per cubic yard for each ¼-mile overhaul, beyond the free haul limit of one mile.

Drainage and grading specifications for gravel and shale surfaced roads are standard with those of earth, with the exception that concrete culverts and bridges are designed to carry a load of 15 tons and have a roadway width of 18 feet.

Concrete Roads

Concrete surfacing has been placed on only two projects in Wyoming to date, namely, a 5-mile section north of the city of Casper on what is known as the Salt Creek Road, which connects that city with the large oil fields at Salt Creek, and an 8-mile section in the Little Goose River valley in Sheridan County which was constructed in lieu of a proposed railroad.

The 5-mile section is 16 feet in width and has an average thickness of 6-1/3 inches. The first 10 miles of the latter project is 16 feet in width, and the remaining 3 miles 10 feet in width. The material specifications for both projects were identical, providing for a one-course pavement of a 1:2:3 mix. River-washed sand and gravel was used, being graded down from a 2-inch diameter stone with not more than 5 per cent passing a 100-mesh screen. Expansion joints ¼-inch in width were placed every 30 feet and filled with an asphalt joint filler. Both the pavements have been subjected to a very heavy traffic for the last 18 months, with no cracks or apparent deterioration.

The Growth of Akron

What the Fastest Growing City in the United States Owes the Rapid Expansion of the Automotive and Rubber Industries

AKRON, OHIO, the prodigy child of the automotive and rubber industries, to-day has the distinction of being the fastest-growing large city in the United States. According to the Census Bureau of the Department of Labor, the city's population increased 201.8 per cent during the last decade, leaping from 69,067 in 1910 to 208,435 at present.

Credit for the phenomenal growth of Akron during the last ten years is divided between the rubber industry and the automotive industry. Working together, these two industries lifted Akron from obscurity and placed it high among the foremost manufacturing centers of the world. Twenty years ago there was nothing unusual about Akron; it was hardly known outside the state. Those who knew of its existence thought of it as "that little city up in the hills of northern Ohio where sewer pipe, breakfast foods and farm implements are manufactured."

Then, suddenly, Akron began to grow. Factories sprang up, and thousands of new homes were built. The word went out that Akron was "a real town, where money could be made," and men and women began coming to the city from all sections of the country. During this period when Akron's growth began getting under way, there were many who classed the city with the "boom" towns which sprang up one day and settled down into mediocrity the next. But they were wrong. Akron's growth continued, year after year.

Marvelous as this growth has been, the reasons for it can be easily given. Ask an Akron resident why the city has leaped ahead and he will answer with one word—"rubber." The automotive industry shares in the credit for making Akron, because it caused the expansion in the rubber industry. When the automobile was invented, a need arose for rubber tires which would prevent the machine from being jarred to pieces. Akron rubber factories supplied this need, and in so doing expanded out of all proportion to their former size. And as the rubber factories grew, so grew the city.

Although Akron has been before the public eye only a comparatively few years, it is one of the oldest cities in Ohio. The first settlement within the territory which now comprises the city was made in 1807, at Middlebury on the Little Cuyahoga

THE HEART OF AKRON, LOOKING NORTH ON MAIN STREET

ORIGINAL BUILDING OF THE B. F. GOODRICH RUBBER COMPANY AT AKRON

River, where plenty of water was available, and for many years it was the market town and commercial center of a large section of northern Ohio. Akron was incorporated as a city after an enumeration showed it had a population of 5,066. From then on the city grew steadily, participating in the increasing activity given to commerce, manufacturing and agriculture by the Civil War. The advent of railroads made it possible for the city to reach markets which were inaccessible before and to compete with other cities. The first railroad, a branch of the Cleveland & Pittsburgh, entered the city in 1864. To-day Akron is on the main lines of the Erie, Pennsylvania, and Baltimore & Ohio and is connected with the Wheeling & Lake Erie by the Akron, Canton & Youngstown, and with the New York Central by the Northern Ohio.

Prior to the twentieth century Akron acquired some measure of fame as a manufacturing center through the manufacture of clay and cereal products, farm implements, cast iron products, binder twine and matches. It was almost by accident that Akron became the center of the rubber industry.

In 1867 Dr. Benjamin Franklin Goodrich started a rubber factory in Hastings-on-the-Hudson, N. Y. The venture was not a success, and after a year Dr. Goodrich moved his plant to Melrose, N. Y., where he started again after securing financial help from a friend. Competition of other eastern rubber factories proved so keen, however, that this venture turned out to be as much of a failure as the other, and Dr. Goodrich decided that it would be advisable to relocate in the virgin fields of the West. He was attracted to Akron by an offer of financial assistance from several Akron men, and in 1870 moved his plant to that city. He started manufacturing in a building 40 by 100 feet, with a force of 35 employes.

The company encountered only a small measure of success at first. It struggled along, often on the verge of bankruptcy. Many of the original stockholders became discouraged and dropped out. In spite of bitter disappointment, however, Dr. Goodrich finally secured the financial assistance which enabled him to place the company on a paying basis.

In the years which followed, the business grew steadily. Rubber goods came into

THE B. F. GOODRICH RUBBER COMPANY TO-DAY. THE ORIGINAL PLANT COULD BE TUCKED AWAY IN ANY ONE OF ITS LARGER BUILDINGS AND LOST. THE COMPANY NOW HAS 63 BUILDINGS, COVERING MORE THAN 100 ACRES. IT EMPLOYS 26,000 PERSONS more common use, and several additions were made to the original "smelly little shop by the canal." Other important rubber companies were founded in Akron, including Firestone, Goodyear, Miller and Swinehart, and soon the industry was centered in the city. To-day Akron manufactures fully half of all the rubber goods made in this country.

The rubber industry received its first great impetus when the bicycle was invented and rubber tires were needed. This impetus was as nothing, however, in comparison with that given when the automobile came into use. The first tire, which was made at the Goodrich factory, was a curious affair. It had sixteen plies of fabric and a tread an inch and a half thick. Experts say it was the best tire ever built and at the same time the poorest—it burned itself out before going 500 miles. Improvements on the tire came fast, however, and by the time automobiles ceased to be a luxury and became a necessity of everyday life, first-class tires were made in quantity.

As the demand for automobiles increased, the factories expanded. Numerous additions to existing plants were made and many thousand new employes added. In 1910, 4,000,000 tires were manufactured in the city, but, large as this production was, it proved to be just a beginning. In 1915, 10,000,000 tires were manufactured, and last year 20,000,000. To-day tires are being turned out at the rate of one a second, indicating a production of at least 30,000,000 for the year.

As a result of this increase in production, a flood of gold has poured steadily into Akron, making it one of the most prosperous cities in the country. The sales of the rubber companies amounted to about $40,000,000 in 1910. In 1915 they totaled $121,085,000, and last year jumped to $427,796,000. A large part of this income was turned over to the employes of the companies, the pay-roll last year amounting to $101,178,000.

The expansion of the rubber industry resulted in a corresponding growth of the city. In 1910 the rubber industry employed 13,631 persons. It now employs 86,000, and the number is constantly increasing. Great difficulties have been encountered in housing the incoming thousands. Homes could not be built fast enough to supply the demand. When the war practically put a stop to all building, the situation was further aggravated. Last year, however, great steps were taken in home construction, and at present only the scarcity of building materials is preventing the work from being carried on.

Besides leading the country in population growth, Akron claims distinction for many other things. Labor troubles are practically unknown in the city, simply because the factories have always made it a policy to pay high wages and provide good working conditions. Various means have been adopted by the companies to make the employes feel that they are partners in the business rather than merely hired hands. Club houses and gymnasiums have been erected for the employes' use, libraries have been established, medical and dental service is furnished without charge, and assistance is given in the purchase of homes. The Akron plan of Americanization work has been adopted by the entire country, and the Akron system of promoting amateur athletics in the industries has been used as a model for similar work in numerous other cities.

New Building in American Cities

The following is a list of the leading cities in new building for the first six months of 1920, sent out by the Bureau of Publicity of the Omaha Chamber of Commerce:

	City	Population	New Building First Six Months of 1920	Per Capita
1	New York...	5,621,151	$169,966,062	$30
2	Chicago	2,701,212	50,256,600	19
3	Detroit	993,739	48,733,800	49
4	Cleveland ...	796,836	41,162,575	51
5	Philadelphia..	1,823,158	38,570,395	21
6	Los Angeles..	575,480	24,197,639	42
7	Baltimore ...	733,826	19,103,413	26
8	Boston	747,923	17,253,115	23
9	San Francisco	508,410	14,873,516	29
10	Akron	208,435	14,201,132	68
11	Newark	415,609	13,825,817	33
12	Milwaukee ..	457,147	11,365,891	25
13	St. Louis....	773,000	10,701,608	14
14	Omaha	191,601	10,574,265	55
15	Washington..	437,571	10,322,035	24
16	Minneapolis..	380,498	10,047,920	29
17	Atlanta	200,616	9,080,533	45
18	Kansas City..	313,785 (est.)	8,932,055	29

Forward Steps
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

Recreation Departments

A Modern Swimming Hole

MINNEAPOLIS, MINN.—Camden Baths, in the north section of Minneapolis, is as close to the ideal swimming hole as a modern bathing place can be. Shingle Creek is dammed at a certain point, and the pent-up water is given outlet through the bathing pools proper, and allowed to empty into the creek below the dam. It is truly the old-fashioned swimming hole, with the snags and treacherous uncertainties eliminated, the bottom concreted at certain and uniform depths, and the dressers of green foliage replaced by fixtures of more safety and security. It is the swimming hole without the dangers, chances and inconveniences, and made modern by walled dressing space, steel lockers, concreted pools and adequate supervision. The pure, fresh air remains, for there is no roof.

The construction of a concrete dam, having a head of 8 feet, caused a lake to form, the overflow from the dam being run through pools. A fishway is provided on one side, and on the other two sluiceways with hand-operated gates, each about 2½ feet in diameter, are constructed to aid in the rapid disposition of flood waters. The spillway is about 24 feet long and the crest slightly above the intake of the pools.

The pools, one shallow and one deep, are located above the dam, their length parallel with the spillway of the dam, and the natural flow of the creek about 45 degrees to the dam and also to the pool. The pools

PAVILION AT CAMDEN BATHS. THE STREAM IN FOREGROUND PROVIDES WATER FOR THE SWIMMING HOLE are flanked on one side by the locker rooms and on the other by a memorial field house, and an 8-foot concrete wall functions for the green foliage of boyhood days, in obstructing the view of the intruder. About 40 feet up-stream from the dam the water is let into the shallow pool through a 20-foot passage. The pool itself is from 3 to 4 feet deep, 60 feet wide, 125 feet long, concrete-lined, with a 10-foot concrete platform all around it. At the lower end the water is allowed to pass into the diving pool, which is likewise of concrete, 9 feet deep, about 45 feet wide and 45 feet long, allowing the excess water to flow over as in dam construction and falling 10 feet to the creek below the dam.

As has been mentioned, the locker rooms are at the side of the shallow pool, and it is through these rooms that bathers enter the baths. In the men's side there are 22 dressing rooms and about 250 lockers, most of the men using the benches between the lockers in preference to dressers. The women have 24 dressers for about 175 lockers, all using dressers, there being no benches in this department. There are showers in connection with the dressing-rooms as well as toilet accommodations.

These baths are always well attended, and on hot days as many as 3,000 bathers have made use of the facilities.

THEODORE WIRTH,
Superintendent of Parks.

Departments of Education

Cleveland Makes School Gardens Pay

Cleveland, Ohio.—This city believes in gardens as a community asset. Home garden cultivation and training for commercial gardening are both included in a program of the Board of Education in that city, which is carried oot so as to reach the family direct and influence many parents as well as the children. Gardening in the Cleveland school system is not a classroom abstraction, but a part of the home life.

CHILDREN'S INTEREST BEGINS WITH SEEDLINGS

In the course of the spring and summer the garden teacher comes to be a familiar visitor in many neighborhoods of Cleveland. When she calls on a youngster the mother and father take as much interest as anyone in the discussion of the garden. The child may be tending only a few rows in the family garden, or he may have a small piece of land to call his own. It is altogether likely that the weeds may have been working faster on the plot than he has, and insects may be threatening the life of the green things. The boy of ten or twelve years who would wage war on garden enemies must possess persistence, patience, and a fondness for the out-of-doors; he has need of all the encouragement and counsel a teacher can give him by way of reinforcement.

Possibly the young farmer may meet his teacher on a large tract garden, instead of at home. Because so many city-dwellers have no yards in which to garden, the Cleveland School Garden department maintains twelve areas, varying from a city lot to ten acres in size, where boys and girls are given individual plots to cultivate. Each gardener receives a section of 200 square feet or more. He pays for his own seeds and takes home or sells the produce, although plowing and fertilizer are usually furnished free and tools are lent for his use.

The youngster is encouraged to look upon his garden, whether at home or on a tract, as a business venture of his own. He is urged to keep accounts of his expenditures and receipts, and, if possible, to work a large enough piece of land so as to make a good profit from the sale of vegetables and flowers. A complete report of his progress is made by the teacher on each visit.

Interest such as this in gardening as a spare time occupation often leads boys and girls on to a more thorough study of the work. A class in horticulture at one Cleveland technical high school not only gives such students a background of theory, but also provides actual experience in propagating thousands of plants in a school greenhouse and truck garden. It prepares them for work with commercial growers or on large estates, or it serves as a preliminary course for those who wish to attend college.

Cleveland was a pioneer in school gardening as early as 1905, but the past three years have been notable for a very considerable increase in the proportions of the work. Since the close of the war interest has grown rather than diminished. The report of Supervisor Eastman for 1919 showed that 7,840 children who had home gardens, and 415 whose plots were located on the tracts, cultivated in all 175 acres and produced crops worth $79,835.

During the present season forty Cleveland teachers are engaged in this task of promoting the garden idea. As a "back to the soil" movement for the city dweller, it looms large in importance in these days of unrest and high prices, Mr. Eastman declares. Those who are engaged in the Cleveland work point to results which demonstrate its worth for the individual child and family, and for civic betterment.

KATHRYN MADDOCK,
Supervisory Assistant, Division of Educational Extension.

Park Departments

Children Organized to "Humanize" a Park

New Brunswick, N. J.—For many years the city of New Brunswick, N. J., has had a pretty park, the gift of a former wealthy citizen, that seemed to supply many civic needs satisfactorily but lacked certain "human" factors that other city parks have. For a long time no one seemed to realize just what this lack was, until finally someone decided it was because there was not enough attraction there to interest children.

The *Sunday Times* of New Brunswick took the matter up and through its columns asked for petitions from local children who wanted a playground established in the city park, and the result was an avalanche of names—thousands being sent to the office during the first two weeks.

So a program was planned that called for about $5,000 worth of equipment and devices. Subscriptions and contributions began to come in and every child who earned a dollar and gave it to the *Times* for the Playground received a button badge that gives them a life membership in the Playground Founders League of New Brunswick. Over a hundred Founders joined before July 4.

One of the principal features under course

CHILDREN RAISED MONEY FOR THIS POOL

of construction at this time is a wading pool of concrete, 30 feet across, with a sand "beach" two yards wide all around it. This pool is two feet deep in the center and about two inches deep at the edge, so arranged that the water can flow continuously or be changed every so often by means of convenient valves. When finished, this pool will be one of the finest in the state. The entire project bids fair to create more than an ordinary amount of interest, inasmuch as the movement was practically started and carried out by the children of New Brunswick, and it is seldom, if ever, that so extensive an enterprise has been accomplished in this way.

Even if the complete program is not realized this summer, there is little doubt that next season the city will take the matter up and put it through, as the move is far too popular to die out—indeed, it is very doubtful if the energetic youngsters who are backing the plan would allow it to do so.

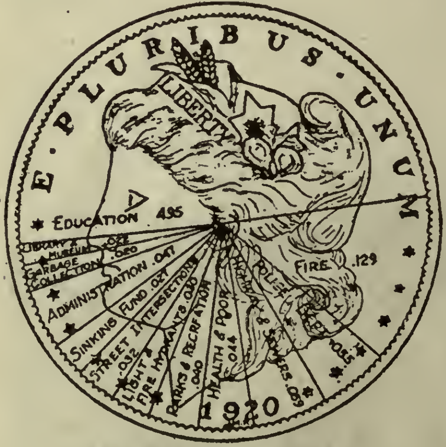
FRANK A. CONNOLLY,
City Commissioner.

City Managers

Where the Money Goes

Grand Rapids, Mich.—The citizen of Grand Rapids does not wonder what becomes of the money he pays out in taxes; nor is he obliged to decipher the columns of figures of the city budget. A glance at the circle of the "taxpayer's dollar" shows him what proportion of the funds is spent for education, fire protection, garbage collection, or any other municipal activity. This design is stamped on the back of the original and duplicate of every tax receipt issued by the city.

FRED H. LOCKE,
City Manager.



THE TAXPAYER'S DOLLAR

Highway Departments

Planning Prevents Steep Grades in City Streets

Birmingham, Ala.—About fifty years ago a land company was incorporated which acquired a number of farms for the purpose of laying out a town site which was named "Birmingham." The project dragged along for a number of years, passing through several boom periods and times of depression before it finally settled to a steady growth, which has resulted in a city of over 200,000 population.

The original town site was known as "Jones Valley," being bounded on the southeast by Red Mountain and on the north by a series of ridges approximately parallel to Red Mountain, the general trend of the valley being northeast and southwest. Along the center of this valley had been constructed the Alabama Great Southern Railroad, which passed through the town site on a tangent. The center line of the railroad was used as the base line and avenues laid out on either side parallel to the railroad, the streets being laid out at right angles to the avenues. For approximately a mile on each side of the railroad the land was approximately level, and consequently few grade problems were encountered in constructing the highways. The business portion of the city is from 500 to 600 feet above tide; the top of Red Mountain, which is about two miles from the center of the city, is from 1,000 to 1,100 feet above tide. The ridge on the north side is approximately 200 feet higher than the center of the city. The first maps made of the town site continued the rectangular layout to the top of the mountain on the south and to the top of the ridge on the north, which resulted, in many instances, in very steep grades. This layout has

NORWOOD AVENUE IS AN ATTRACTIVE RESIDENTIAL STREET. WITHOUT CAREFUL PLANNING THE GRADES HERE WOULD HAVE BEEN TOO STEEP TO ENCOURAGE BUILDING DEVELOPMENTS

since been corrected as far as possible, although it was impossible to make a complete new layout owing to the fact that dwellings had been built along many of these steep streets. Highland Avenue was laid out following approximately the contour of Red Mountain at the foot of the steeper slopes. This avenue is approximately three miles long and 100 feet wide. As constructed, there are sidewalks 15 feet wide on either side, two driveways each 20 feet wide, and a grass plot 30 feet wide along the center, a double track trolley line occupying the center strip. This avenue is very crooked; however, the curves being light it affords very pleasant driving.

Several reservations were made for small parks or sunken gardens along this highway, which are really the heads of small hollows, and, as treated, present a very pleasing effect. Owing to the fact that there were large areas on the slope of the mountain, owned by the land company, in which very few sales had been made, and also a number of areas which were not owned by the land company, although partially surrounded by its holdings, it was possible, by the purchase of small holdings and the coöperation of large holders, to make a new layout of much of the territory.

Consequently very pleasing results have been obtained along the slope of Red Mountain and its foot hills. Only recently a survey embracing some 200 acres on the slope of Red Mountain has been vacated and laid out so as to conform more closely to the contours of the ground. Then again, some years ago the State Legislature passed a law requiring all land plots and subdivisions to be submitted to the city for its approval before being placed on record. This, together with the hearty coöperation of the larger land owners has produced excellent results. When the town site was originally laid out there was an area lying in the northeastern portion of the original town site through which the checker-board system of streets and avenues was extended. The streets and avenues each were 80 feet wide, the blocks were 400 by 500 feet, each block contained two 20-foot alleys running parallel respectively with the streets and avenues. This territory being very rolling in many places, the grades would have been practically impassable. Since there had been practically no sales in this area, the city and the land company entered into a new survey of the entire tract, the land company agreeing to submit its plans to the city and to devote as much area to street purposes in the new survey as was contained in the old. As a basis of the new layout, Norwood Boulevard was plotted 200 feet wide and approximately 1½ miles long, following as closely as possible the contours of the ridges. An 80-foot avenue which ran northeast and southwest along an extremely rugged location was entirely eliminated. The east and west alleys, as a rule, were also eliminated. The location of the streets were changed, where necessary, to secure satisfactory grades. The lots were changed so as to front on the streets instead of the avenues as originally planned. This arrangement, of course, gave less depth to the lots; but since after the change their depths are approximately 190 feet, the arrangement has proven satisfactory. As a general result, the city obtained several acres more street area and the company something like 10,000 feet of additional frontage as compared with the original layout. Norwood Boulevard was improved by constructing sidewalks 15 feet wide on each side, and adjacent to the sidewalks driveways 20 feet wide were paved with bituminous material. This left a neutral strip 130 feet wide, which is used for playgrounds and park area. This arrangement of the driveways permitted their construction on entirely different elevations where the elevation of the adjacent territory rendered such construction advisable. Although the construction was not completed until 1913, there are very few vacant lots in this territory at the present time, whilst prior to the change of layout there was practically no demand for this property.

JULIAN KENDRICK,
City Engineer.

Finance Departments

Helping the Tax Collector

Baltimore, Md.—The Baltimore Municipal Journal has published the following calendar prepared by the Tax Department. It is intended to inform the taxpayers as to the city's tax requirements from the beginning to the end of the year:

January 1—State and City taxes are receivable, or as soon thereafter as practicable.

State tax rate is imposed biennially by the Legislature.

February—Greatest discount period.

May 31—Last day for discount on taxes due the Mayor and City Council. No discount is allowed on taxes due the State of Maryland.

July 1—Interest begins on City taxes.

September 1—Interest begins on State taxes. Chap. 261, Sec. 48, Acts 1918.

Last day to file application with Appeal Tax Court for reduction of real estate assessments.

Last day to file application with Appeal Tax Court for reduction of personal tax assessments.

September 15—All departmental estimates for the following calendar year must be submitted to the Board of Estimates. The Board then resolves itself into a Budget Committee. These departmental estimates are carefully gone over at public meetings and the amount necessary to run the City is ascertained. Having deducted the estimated receipts from all sources, other than taxes at the full City rate, from the total of the amounts allowed the departments, boards, etc., there remains a sum to be raised. This balance must be raised at the full City rate. Knowing the exact assessable basis chargeable with the greatest rate, by application of the simple multiplication table is found the rate necessary to produce the amount required.

December—Tax rolls delivered to City Collector when completed. Bills typed, verified and filed. Tangible and intangible advices calculated and mailed the day before the opening of Tax Collector's books for general collection.

Tax Rates—Full rate for 1920 is $2.97 per $100. Suburban is two-thirds of full rate.

Rural is one-third of full rate, but not less than 65 cents per $100.

New addition is 62 per cent (1920) of the full rate, increasing 2 per cent each year until the rate equals the full City rate.

Helpful Hints—Our floor space and manpower is limited, so exercise patience, as everybody cannot be waited on at the same time. You are but one in thousands of taxpayers.

Do not delay sending written requests for information.

Do not hold back checks in payment of taxes until last day of the month.

Address all communications to Augustus M. Denhard, City Collector, City Hall.

It is believed that such an announcement published in the municipal journal, if the city has one, or in the daily papers, once a year or oftener, will do much to encourage the prompt payment of taxes and in other ways to facilitate the work of the collector.

AUGUSTUS M. DENHARD,
City Collector.

Pittsburgh Will Get More Use from its Parks

The Pittsburgh Chamber of Commerce has recently adopted a resolution in favor of a more liberal policy of Sunday amusements in that city. The resolution proposes the opening of parks and playgrounds on Sunday afternoons for amateur athletic games and sports, free movies of an educational and uplifting character in school buildings, with open forums and community singing. The resolution further recommends increased appropriations by the City Council and Board of Education to promote the more effective use of existing facilities in parks, playgrounds, schools and public halls.

Sewage Solids: Their Disposal and Value

By John R. Downes

Superintendent, Sewage Disposal Works, Bound Brook, N. J.

THE great problem in sewage disposal to-day is sludge disposal. It is comparatively easy to dispose of the liquid portions of sewage with very little or no odor. Any degree of purification consistent with local demands may be obtained, the degree of purification being simply a matter of costs which are not necessarily excessive. The solids, however, are a volume of material too small as a rule to justify the installation of extensive handling machinery, too large to be disposed of by a small well-trained force, and too distasteful to appeal to the casual labor of the day.

A recent report on an experimental method of sewage disposal dismissed the sludge question quite airily by stating that the amount of sludge produced by the system on the experimental scale was so small that what the neighbors did not take for their gardens was dumped into the stream. As a matter of fact, the sludge produced in this particular case was even greater than usual because chemical precipitation was used, and in any working scale plant the sludge would be a veritable incubus.

The above simply indicates how little the seriousness of sludge disposal is appreciated. As an aftermath of the extravagant claims formerly made for the septic tank, there still lingers the idea that preliminary tankage treatment produces some mysterious effect on the liquid portion of the sewage. The sooner it is realized that preliminary tank treatment of sewage is merely a treatment to separate the solids from the liquid, the sooner we can look for real progress in sewage disposal.

Separation of Solids and Liquids

Once the separation of the solids from the liquid is made, the further treatment divides itself into two parts—treatment of the liquid, and treatment of the solids. It is with the treatment of the solids that this article deals.

A portion of the solids are sometimes, as at the Bound Brook plant, separated by means of a mechanical screen, and in this case, as a usual thing, the solids are disposed of directly without further treatment. Where the solids are separated in tanks by sedimentation, it is the custom to attempt to reduce the volume of material to be handled by further treatment. Usually this treatment is biological and consists merely of storage for a sufficient length of time under favorable conditions.

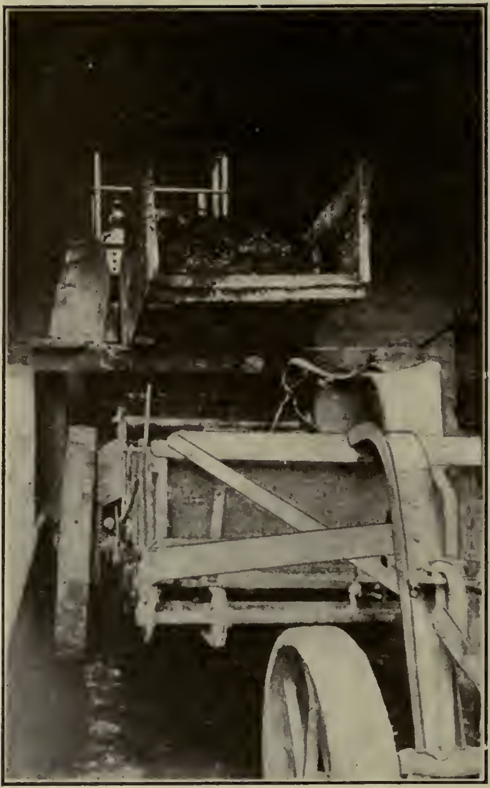
The material spoken of as sludge in this article refers to solids digested in a two-story tank and air-dried on stone beds, unless otherwise stated. The solids removed by the screen are referred to as screenings.

In an installation of a mechanical screen capable of handling about four million gallons of sewage daily, ample provision was made for carrying the liquids passing through the screen onward to the next step in the process. The mechanical work of the screen had been given such attention that the whole mechanism could be moved by the touch of a finger, and the power consumption for regular operation was only 2/3-horse-power. With this the screen concern feels that it has fulfilled its duty and leaves the disposition of the solids unprovided for.

It was in working out a solution of this problem of disposing of the solids from a mechanical screen that we hit upon the idea which has proved so valuable in the handling of sludge from the two-story tanks at the Bound Brook plant.

Disposing of the Screenings

The cans provided to catch the screenings were so large that one man could barely move them about empty, and the weight of the contents would be about 650 pounds. With no lifting devices at hand, we promptly dismissed the cans from consideration, and, pending the development of some better plan, allowed the solids to fall to the concrete floor, from which they were hand-shoveled into a one-horse dump-cart. The next step was to provide a dump-cart specially designed to fit under the discharge spout of the screen and catch the screenings direct. This facilitated matters at the loading end, but spreading the screenings in the field after they had been dumped from the wagon proved to be even more arduous and unpleasant than the loading at



THE SPREADER IN PLACE BENEATH THE TIP BODY READY TO RECEIVE A LOAD OF SCREENINGS

the screen. The screenings, if left in heaps, produced considerable odor in a short time, and the only way to dispose of them without odor was to have them spread out in a thin layer as soon as possible and plow them under the surface just far enough to assure that they were well covered.

In seeking for a mechanical spreading device, we decided to try a manure spreader such as is used on any up-to-date farm. The spreader proved to be a great success, but it is a job for a husky three-horse team to operate such a machine continuously. On consideration, however, it was determined that it cost more to keep even a two-horse team than to operate a tractor.

After investigating about 150 makes of tractors, we chose for our work one of the endless-track or caterpillar type. While these cost more to purchase and the upkeep is somewhat higher than on a wheel type machine, we felt justified in our choice because we had to have something that could work every day in the year regardless of weather or ground conditions, also something that would not tear up our stone roads to and from the field.

The machine spreading was far superior to hand work. In hand spreading the solids fall in big clumps which are very hard to cover with a plow. The machine spreads the material in a shower of fine particles, and with our special high-speed attachment makes a very uniform coating about ½-inch in thickness. This coating is easily turned under without leaving a trace on the surface. When the plow has gone over the field there is no evidence of sewage and only the faint odor of newly turned earth so familiar in any newly plowed field.

Observing the success of this system of disposing of the screenings, the same system was applied to the dried sludge. This proved equally successful. The sludge is still loaded by hand, as a satisfactory loading device has not yet been designed.

The screenings drop from the screen chute to a wooden platform, from which they are thrown back occasionally by hand into a tip body balanced on a beam, beneath which is a concrete inclined runway to receive the manure spreader. When the tip body, which holds the same quantity as the spreader—2 cubic yards—is filled, the trigger is removed, the body tipped, and the sliding body of solids gathers impetus and strikes the inside of the front end board of the spreader with an impact sufficient to move the spreader ahead in its runway so that the whole body of solids slips easily into the body of the spreader, filling it completely and evenly.

The production of sludge at the local plant in three years, during which the population served increased from 22,000 to 35,000, was 9,222 cubic yards as it came from the digestion tanks with 5 to 6 per cent solids. This volume was reduced by drying to 2,393 cubic yards as put onto the fields, with 25 per cent solids.

This 25 per cent sludge is rather more wet than is convenient to handle, but to dry it further requires a time factor out of all proportion to the results obtained, especially where one is pressed for drying space, as is the case locally.

A 1,000-gallon tank cart provided with wide wheels has been found very convenient with the tractor. Such a tank eliminates waiting for sludge beds to dry, and while the volume of material is, as shown, four times as great as that of dried sludge, all manual labor in handling the sludge can be eliminated, and the cost is actually less than for handling dry sludge.

To dispose of 2,393 cubic yards of sludge by one horse cart and hand spreading:

1,874 man hours.........	@ .50	$937.00	
1,874 horse hours........	@ .25	468.50	
			$1,405.50

To dispose of same by manure spreader hauled by a tractor:

1,595 man hours.........	@ .50	$797.50	
1,296 tractor working hours	@ .45	583.20	
			$1,385.70

To dispose of 9,222 cubic yards of undried sludge drawn direct to tank cart:

1,352 man hours.........	@ .50	$676.00	
1,106 tractor operating hours	@ .45	497.70	
			$1,173.70

Having plowed the solids under the ground without nuisance, we congratulated ourselves that we were well rid of them, but the appearance of acres and acres of weeds made the fields look as disreputable as a suburban real estate development, although shrubbery had been planted about the drives and corners to give the effect of a park.

Raising Crops on Sludge

It became evident, then, that the work was not finished and that the ultimate disposal of sludge required the cultivation of the fields. For esthetic reasons, if for no other, trucking crops were not considered suitable to our purpose. The grains all do well on this fertilizer, and which grain to raise depends upon the time of year when the field is ready for the cropping treatment. Fall grains gain enough headway in the early spring to get ahead of the weeds; corn is an excellent crop to raise on fields ready up to the first of June, if the cultivation is very thorough. Extra work in this line is required, however, for success. Oats are outgrown by weeds unless they can be gotten in very early.

In order to determine the actual fertilizer value of sludge,—a question which has long been under discussion with no very satisfactory conclusions,—a piece of land was selected 7¾ acres in area, which had been stripped in a grading operation and on which experiment had proved that no vegetation could subsist. The soil was sand and gravel with a little shale. By growing oats on this field one year, and corn the next, two average growing seasons were covered under practical working conditions, yet with the assurance that all vegetable growth which we might obtain came entirely from the sludge. The writer did not set out to prove anything pro or con, but simply to ascertain the truth for his own information. The opportunity seemed too good to be lost as all the artificial conditions of the usual growing tests were eliminated.

Under the conditions described above for the two years, a total of 43 tons of sludge per acre produced 42 bushel of oats and 50 bushel of corn. The labor regularly employed about the disposal plant was used for this farming operation, and a careful account of the time was kept.

Applying the prevailing wage rate and quotations on grain for the same day in January, 1920, the crops would be worth $95.90, and to produce them would cost $51.80, leaving a yield value of the sludge equal to $44.10, or $1.02 per ton delivered and spread in the field. Delivering and spreading the sludge, including up-keep of machinery, cost at the center of the disposal area, $0.45. The net yield of a ton of sludge, then, is $0.57.

SPREADING THE SCREENINGS ON THE FIELD

The solids can be plainly seen showering from the tail of the spreader. Their velocity may be judged by their blurred appearance in this snapshot.

Some minor experiments were carried on two years ago to determine the proper thickness of the sludge coating. The following year this experimental area was worked in with a much larger adjoining field, the whole being coated with barn yard manure and a cultivated crop raised. This year the combined areas were planted in oats without any additional fertilizer, and there is a distinct dark patch of extra luxuriant growth over the area which had received sludge two years ago, showing a stamina, or hang-over value, with which sludge has not been generally credited. This would add to the $0.57 per ton value shown above.

A further experiment was made by comparing sludge and green stable manure in strips in a field of corn. No difference was evident, although the comparison was carried to the extent of comparing the number and size of the ears growing on the two fertilizers.

This experience would suggest that the cash value of sludge in any given locality would be equal to the cash value of stable manure, but the market for the former is limited by an aversion to it on esthetic grounds as well as because of the number of weeds which it produces, making the area unsightly.

Jamestown Establishes Municipal Milk Plant

August 24, 1920.

To the Editor The American City,
New York City.

Dear Sir:

The taxpayers of the City of Jamestown by a large majority vote decided at an election held August 21, 1920, to establish a municipal milk plant and sanitary distribution system in the City of Jamestown, and a proposition to issue bonds to the amount of $150,000 was authorized, and the creation of a Commission to be appointed by the Mayor, consisting of four members to carry out the scheme of municipalization of the milk supply.

This proposition was submitted to the taxpayers, a year ago, and was defeated by an overwhelming vote. The favorable decision at the recent election showed a complete reversal of public sentiment and a pronounced vote in its favor. The plan contemplates the erection of a central station to which all milk from the producer will be brought and tested in a scientific manner, each can from each producer being subjected to an individual test so as to safeguard against bacteria and impure milk. The producer will be paid on the basis of the quality of milk supplied; those having the lowest bacteria count and highest percentage of butter fat will receive the highest price for milk. The milk will be clarified and all milk, except Grade "A" raw milk, which comes from tuberculine tested cows, will be pasteurized, and all milk will be placed in bottles under the improved method of bottling, under which the milk is free from the touch of human hands or any contamination. The milk will be delivered at an early hour to each householder. The city will be divided into 30 districts, one delivery man for each district, these will take the place of the 70 milk peddlers who are now supplying the city with milk, and who are crossing each other's tracks continually and thereby entailing a duplicate expense and waste of effort, which is now borne by the community. The municipal system will eliminate the added cost of the present middleman's profit.

The price of milk at the present time in the City of Jamestown is 15 cents per quart for Grade "B" milk. Under municipal operation, it is believed that the milk can be sold at a considerable lower price, and that the consumer will get an improved quality of milk with a full cream content, which is not now the case and that the farmer will receive a higher price for his product than he now receives.

The 40,000 people of the City of Jamestown pay out annually, under prevailing prices, more than one million dollars for milk. This is 60 per cent more than the entire municipal tax budget for all city purposes.

But the innovation by which it is proposed to eliminate the element of exploitation of the milk supply in the City of Jamestown and make the supply a matter of public service is favored more as a health than an economic measure. because under the present system a germ-laden bottle of milk delivered to the back door of a home often means a crape on the front door.

By-products which are often of considerable amount in a central plant will be utilized by the city for the manufacture of cheese, butter and buttermilk.

The proposition to municipalize the milk supply is not a socialistic measure, but a common sense, businesslike method by which the citizens unite in the employment of the agency of the city government to do in an economical and sanitary manner that which a superfluous number of peddlers are unable to do under competitive conditions for private gain.

The foremost sanitarians and health authorities of America have endorsed the Jamestown plan of handling the milk supply as the only solution to the milk problems.

Very truly yours,
SAMUEL A. CARLSON,
Mayor.

Negligence Claims Against Municipality

Formal Notice Necessary Precedent to Action

By Arthur L. H. Street

BY special statutory provisions the municipality is favored in most, if not all, of the states, over the ordinary defendant in an action for injury to person or property. It is now very commonly required by state law or charter provision that no suit shall be maintained against a city on account of injury caused by negligence, etc., unless some such formality as filing notice of the claim is first gone through. But excepting as requirements of this kind are expressly made, suit may be brought against a municipal corporation without previous notice, the same as it may be brought against a private corporation or an individual.

The requirements under this head have not been standardized. Resort must be had to the particular charter or code governing a municipality. Yet there are very numerous appellate court decisions which have served to crystalize legal principles of general application. For instance, it is generally held that "such charter or statutory provisions, so far as the requirement of a notice or presentment as a condition precedent is concerned, are in derogation of common right, and should be strictly construed, and cannot be extended by implication beyond their own terms, and therefore will not require such notice with respect to damages which are not within the intention of the statute; but where a notice or presentation has been given or is made, its sufficiency under the statute is a remedial matter, and it should be liberally construed. Such provisions are generally declared not to be retroactive." (28 Cyc. 1450.)

That a legislature may constitutionally require giving of notice or presentment of claim before suit may be filed has become a proposition well settled by a long line of appellate court decisions handed down in states including New York, Wisconsin, Alabama, Texas, Indiana, Illinois, Michigan, Washington, Tennessee and Utah. But, as declared by the Washington Supreme Court, in the case of Hase vs. Seattle, 51 Wash. 174, 98 Pac. 370, 20 L. R. A. N. S. 938, the requirement must be reasonable in its terms, and is merely to be regarded as affording the municipality fair opportunity to prepare for trial if it is deemed inexpedient to settle the particular claim. In the cited case it was decided that requirement that claimant state his place of residence during the past year was invalid.

It has been frequently decided by courts of last resort that a notice or statement of claim need not *strictly* comply with the statutory requirements; it is sufficient that there is a *substantial* compliance.

Ordinarily, the vital elements of the notice or statement of claim are time, place and cause of the particular accident, and the nature of injury resulting.

As to time, the Connecticut Supreme Court of Errors seems to reflect the general judicial view by holding that the notice or statement must be so specific as to enable the municipality's representatives to inquire into the facts surrounding the claim. (Shaw vs. Waterbury, 46 Conn. 263.) In the latter case of Gardner vs. New London, 63 Conn. 267, 28 Atl. 42, the same court decided that a notice of claim was vitiated by a variance of three days between the time of an accident as stated in the notice and as actually found to be the fact. But there are several decisions to support the just proposition that "a slight variation in time will not render the notice so defective as to defeat the action." (28 Cyc. 1457.)

For example, a New York court decided that the fact that a notice stated that an accident occurred on the 5th of the month did not preclude claimant from recovering on proof of an accident occurring on the evening of the preceding day. It is conceivable that a notice might be fatally defective for failing to state the particular time of day when an accident occurred.

The author of the article in Cyc. on Municipal Corporations, and the annotators of that article in bringing it down to date, set forth numerous illustrations of notices which have been held to have been sufficient or insufficient in the matter of stating the *place* where an injury complained of occurred. Notices upheld include the following designation of places: where a sewer crossed a named street between F and H Streets (Denver vs. Barron, 6 Colo. App. 72, 39 Pac. 989); "A hole in the sidewalk situated between Hotel Cleaves and Dunbar Brothers' store upon town way in said town of Sullivan" (Hutchings vs. Sullivan, 90 Me. 131, 37 Atl. 883); a notice specifically describing a defect at the corner of two ways, but not indicating which of the four corners (Sargent vs. Lynn, 138 Mass. 590); on the certain side of a named street between two other specified streets (Lincoln vs. Mays, 2 Nebr. 204, 96 N. W. 484); on a certain street opposite a well-known hotel (Dallas vs. Myers, 64 S. W. 683). Cases in which it has been decided that notices insufficiently indicated the place of accident include Gardner vs. Weymouth, 155 Mass. 595, holding that a statement that an accident occurred on a sidewalk where there was a hydrant was fatally defective.

Inconsistent descriptions in notices will not vitiate them if the place can be located with reasonable certainty; for example, where the place is indicated as being in front of a certain street number and premises occupied by a certain person, on the *west* side of the street, when, in fact, the place, as indicated by the occupant's name and the number, is on the *east* side (Cloughessey vs. Waterbury, 51 Conn. 405); or where a landmark was mentioned as being 847 feet south of another point, whereas it was 860 feet south. (Davis vs. Rumney, 67 N. H. 591, 38 Atl. 18.) But a New York court holds that a misleading mistake as to house number invalidates the notice.

The nature of the defect or the condition complained of must be designated with reasonable certainty. So the Minnesota Supreme Court in Olcott vs. City of St. Paul, 91 Minn. 207, decided that notice of a claim for injury sustained by falling on an icy sidewalk would not support an action for damages based on falling into a dangerous hole caused by decay of the sidewalk. The Court said:

> "The manifest object of such notice was to enable the municipality, by its governing body, promptly to investigate . . . the time, place and circumstances of the injury, while witnesses were obtainable and facts fresh in their recollection. . . . While we are not inclined to be technical in the construction of notices required under this provision of the charter, and should construe it with reasonable liberality, yet we cannot adopt a view that would dispense with the substantial objects required thereby. We are bound to assume that the distinctive ground for recovery is the defective and rotten condition of the walk, whereby a dangerous hole was permitted to remain therein; and the notice, which directs attention to another claim, might be misleading, and, if treated as sufficient, would require the city officials who were to make the investigation of its condition to act upon any reference to the place of the injury, and necessitate a discovery upon such examination of any cause which might produce the same."

And in the case of Gagan vs. Janesville, 82 N. W. 558, the Wisconsin Supreme Court decided that notice that a pedestrian was injured through stepping into a "hole" in a sidewalk could not be supported by suit for damages sustained through a loose board's turning and causing his foot to slip into the opening created thereby. But any description which reasonably apprises the city as to the defect or wrong complained of is sufficient; for example, a statement that an accident was due to lack of a railing to protect an embankment (Grogan vs. Worcester, 140 Mass. 215, 4 N. E. 808), or to icy and slippery condition of a sidewalk at a specified place (Spellman vs. Chicopee, 131 Mass. 343).

There are numerous decisions on the question of the sufficiency of specification of the nature of injuries sustained by claimant. This point is governed by the same general test applying to the other elements of the notice—sufficiency to reasonably apprise the city as to the nature of the claim against it. But there can be no recovery for injuries known at the time of filing the notice but not covered by it.

> "A failure to give the notice or present the claim in the time and manner prescribed by statute is a bar to the action, and such failure is not excused by the mere fact that the city council or other officers of the municipality had knowledge of the circumstances of the injury, nor by the fact that the person injured had no suspicion or knowledge of the injuries until after the time for giving the notice had expired. Mental and physical incapacity, however, caused by the accident, of such a character as to make it impossible to give the prescribed notice, is ordinarily a sufficient excuse for failing to give the notice within the time prescribed. But disability during a portion of the period allowed will not extend the time of performance provided a reasonable time remains within the period after the disability is removed." (28 Cyc. 1461.)

The Relation of Water to Forestry

By Thorndike Saville

Associate Professor of Hydraulic and Sanitary Engineering, University of North Carolina

THE three great elements in a national program for conservation of natural resources are those pertaining to water, forests, and minerals. Conservation of our mineral resources consists in a restricted use, since they are non-renewable and of limited extent. Conservation of our water and forest resources, on the other hand, consists in the greatest possible use commensurate with economic demands and proper provision for their replenishment. It is these latter resources which this paper considers. They are susceptible of constant renewal and perpetual use under scientific policies of management, but when exploited for immediate profit for the sake of expediency and with no regard to the public welfare, are as evanescent as the less permanent mineral resources.

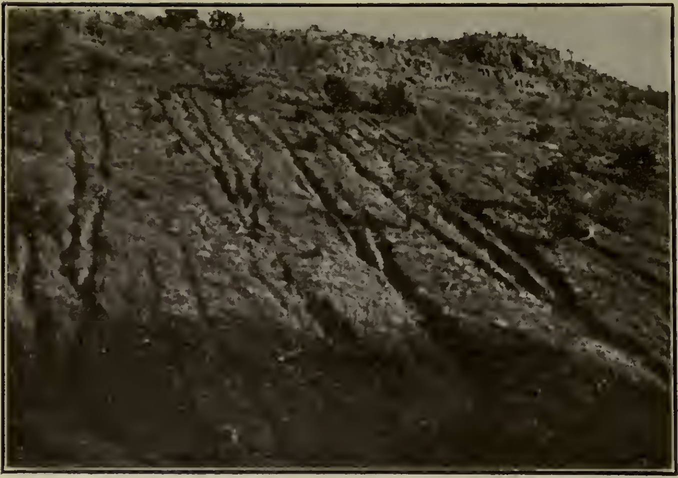
The relation of water resources to forestry is complex. The subject may be considered from three standpoints: first, the effect of forests upon the occurrence and distribution of water, or the hydrological relation; second, the effect of forests upon public health and scenery from their presence on municipal watersheds and reclaimed swamps, or the public welfare relation; and third, the effect of forests upon water-power, navigation, agriculture, etc., or the economic relation.

Hydrological Relation

A considerable literature has grown up in the past ten years relating to the effect of forests upon the magnitude and frequency of floods. Eminent scientists and engineers have violently espoused each side of the controversy. Proponents of forestry measures have made startling claims for the favorable influence of forests in mitigating the evil effects of floods. Some engineers have made equally inclusive statements as to the entire absence of any beneficial effects of forests upon flood control. As a result, due to the emotional appeal of the forestry advocates, the general public has an exaggerated idea of the benefits of forests upon flood mitigation, and scientists are bewildered by the conflicting statistics of engineers.

Out of all of this mass of contradictory evidence a few general principles may be regarded as well established. In mountainous districts, where the streams are bordered by steeply sloping hills the forest cover serves to reduce both the frequency and magnitude of the average flood, and consequently is highly beneficial. After protracted rainfall, when the cover has become saturated, this effect is absent. Therefore the maximum floods, even in mountainous regions, are little affected by the presence of forests. The relative beneficial effect of forest cover decreases with increase in size of the mountain stream. On very large rivers draining a rolling or flat country, the presence of forests does not seem to affect the magnitude or frequency of floods to any appreciable extent.

Like the preceding, the regulation of run-off has long been a moot question, and, as above, the beneficial effect of a forest cover is most evident upon the run-off of streams draining a mountainous territory. The forest roots and humus undoubtedly retain much water from rain-storms, and deliver some part of it later to the streams, thus conserving what might otherwise go to waste on flood flows. Moreover, the shading effected by trees serves to retard the melting of snow and the evaporation from the land surface. On the other hand, the evaporation and transpiration from the leaves is great, especially when covered with snow. The consumption of water by plant growth is, however, less for trees than for any other kind of vegetation. Conifers are the best trees from nearly all standpoints of water conservation. As before, these conditions are most favorable for regulating stream flow in regions of steep gradient where the water from average rains seeps rapidly into and through the humus and is fairly quickly delivered to the stream. The discharge is thereby rendered more constant. In regions of flat gradient the presence of forest cover may be disadvantageous in that seepage is less rapidly removed, increasing the amount of water evaporated by vegetation or used in plant growth, and reducing the discharge of the streams.



EROSION GULLIES ON DEFORESTED SLOPE NEW MEXICO
Gullies are now 10 to 25 feet wide and 6 to 15 feet deep having developed in 2 to 4 years

Erosion and Silting

Removal of forests inevitably causes extensive gullying of the slopes, with consequent transportation of the eroded material to the streams. The result, from a hydrological standpoint, is two-fold. First, the regimen of the streams is disturbed. They must carry a load of detritus beyond the capacity attendant upon their normal gradient. This means deposition, building up of the stream bed, alteration of the course of the stream, and transportation of debris to points below, where navigation and flow in a larger stream may be adversely affected. Second, the detritus washed from the deforested land is transported by the streams and deposited in any reservoirs created for water-supply, water-power, or irrigation purposes. Forestry enthusiasts have stressed the importance of forests in the regulation of flood flows and run-off. The effect of deforestation in causing erosion and silting is probably more important and of more far-reaching consequence. The beneficial effects of forests upon these is very considerable.

Protection of Public Water-Supplies

The protection of impounded public water-supplies from all possible sources of pollution demands ordinarily a minimum use of the watershed for domestic or agricultural purposes. The best kind of watershed, from a hygienic standpoint, is one thickly wooded. Cities are rapidly coming to pursue a definite policy of forestation upon their watersheds used for domestic water-supply. This policy is carried out from the double relation of health and economy. The economic aspects of the question are discussed later. Closely related to the forestation of watersheds is the protection of reservoirs from dust, and the effect of decreased evaporation due to adjoining woods.

Within recent years the drainage of swamps as an anti-malaria measure has been carried out on a constantly increasing scale. The results may be three-fold; first, the elimination of malaria; second, the reclamation of valuable agricultural or building land; and third, the conversion of vast tracts of useless land into ground suitable for forestation.

The creation of parks and open spaces where people living in congested districts may get good fresh air and a chance for out-of-door recreation has become a well-established adjunct of any municipal or state public welfare program. There has been a pronounced tendency of late years on the part of cities to make beauty spots of their water-supply areas. The reservoirs near the city are equipped with attractive buildings, and shade trees to serve as open spaces and recreational centers. The larger areas on the watershed are laid out with walks and drives, experts in landscape architecture and forestry are retained to formulate a policy, and the district is made attractive to automobilists and excursionists from the city. The thoughtful planning of the environs of municipal watersheds was begun by the Metropolitan Water Board in Boston under the direction of the late Frederick P. Stearns. Here miles upon miles of beautiful drives lead the automobilist about the secluded reservoirs and lakes; while the tramper, picnicker, or Boy Scout finds countless paths leading through the wilder portions of the reservation. The whole project is under the guidance of an expert forester and landscape architect. This plan so successfully pursued in Boston has been followed by Hartford, Conn., New York, Asheville, N.

C., and other cities in the prosecution of extensive additions to their water-supply areas. The drives and forests about the watershed are annually attracting thousands of visitors.

Conservation of Water and Forest Resources

The conservation of water resources is effected by the greatest economic use, and is two-fold. The waters not utilized, and which would otherwise be wasted, are set to productive use; and thereby (in the case of water-power) a corresponding saving is effected in on-renewable energy sources, such as coal or oil. With increased cost of fuel, and difficulty in transporting it to inland points, the development of water-power projects has been tremendously stimulated during the past few years.

At present the demand for electric power is far beyond the supply in many parts of the country. Public utility corporations have hesitated to enlarge their plants for two reasons—first, the difficulty in obtaining labor and materials and the high prices for these, and second, the reluctance of public service commissions to allow increase in rates to cover increased cost of new development. This attitude has made it difficult for corporations to obtain money for new improvements. Where water power-sites existed upon navigable streams the policy of the National Government has not been such as to make private power developments practicable. This is now remedied by the recent enactment of the Water-Power Bill, which will tremendously stimulate developments in some parts of the country.

In some of the eastern states the larger water-powers have nearly all been developed. There still remains a vast amount of power in the smaller falls and streams, which individually may not be economically developed. It is now possible, through the utilization of the induction generator, to develop a number of such streams, interconnect them, and tie them into a larger controlling system. They will then feed into the system a variable amount of power, depending upon the season. The development of district water-power schemes of this sort, which in part at least may be automatically controlled, is one of the most hopeful means of increasing electric-power output in manufacturing regions. Several installations are already in operation. Newer developments will probably follow some such scheme as is outlined in the Super-Power project for a great trunk-line system from Boston to Washington, an investigation for which is provided in the last Sundry Civil Appropriation Bill.

Like water-power, the conservation of forest resources is effected by maximum judicious use. The principles of selective cutting and reforestation are too well known to need discussion here. Just as water-power has become finally recognized as a national asset needing federal control, so should general regulations of state and nation control the promiscuous destruction of our forests. A double conservation is possible here also, through electrification of the steam railways. Thousands of acres of valuable forest land are annually destroyed through fire caused by sparks from locomotives. The electrification of the railways in forest regions thus not only effects econ-

WATER WHEEL RUN BY A SMALL STREAM KEPT ALIVE BY FOREST COVER ON AN ADJACENT HILLSIDE, NORTH CAROLINA omy in fuel conservation and operating expenses, but also in preventing the waste incident to forest fires.

The hydrological effect of erosion and silting caused by deforestation has already been discussed. Next to the destruction of the timber itself, probably the gravest economic loss arising from removal of the forests is in the silting of navigable streams and the destruction of valuable bottom lands. Instances are not uncommon where navigable streams which a score of years ago required little maintenance of channel now need constant dredging to remove the deposits brought by floods from the denuded mountain sides. This effect is felt far distant from the source of the trouble, and the material eroded from mountains by torrential streams may eventually cause deposits on a large navigable stream hundreds of miles away. Once the damage is done, reforestation and flood-control works are the only palliatives of the cause. Both have been extensively practiced by the French in the Alps, at great expense. A sound forest policy will eliminate the necessity for such regulatory works.

Some of the most valuable and productive land in upland regions lies in the valleys of the streams. As deforestation proceeds, with consequent erosion, the stream sides are aggraded by the transported detritus. In consequence, at times of flood the water overflows the banks, causing washouts, gullying and destroying the fertile valley bottoms. The remedies and preventives are the same as those described in the preceding paragraph.

Employment of Construction Labor in Winter

The beneficial effects of forests upon watersheds used for domestic water-supply has been mentioned previously. An important corollary of this is the opportunity which municipal and state forests give for the employment of construction labor during the winter months. The present scarcity of skilled labor makes it imperative that laborers experienced in water-works, sewer or road construction be retained throughout the year. If they can be utilized in forestry work on the watersheds during the winter months, they will not be a dead load on the pay-roll. The cities of Hartford and New Haven, Conn.; Boston, Mass., and Nashua, N. H., have practiced this combination of forestry and labor conservation with great success. Even if value of the wood cut will not show a profit, a careful policy will make expenses meet, and serve to hold skilled labor. After a decade or more of such procedure, there may be some actual profit from the forestry operations, as the labor becomes more skilled in lumbering and the value of the timber available for cutting increases.

National Forests and Water Resources

Since 1901, the Secretary of Agriculture has been empowered to issue permits for "the occupancy and use of National Forest lands for the construction, maintenance and operation thereon of project works for the development, transmission and use of power." The policy of the Department has always been to encourage the development of water-power projects on National Forests, but in spite of the fact that many excellent sites exist, relatively few projects have been undertaken. This has been due largely to the provisions of the act which allows the Secretary to revoke a contract at will; to impose new rental rates after a lapse of ten years; to treat appreciation of land as income for rate making, and to other broad-powers of the Federal Government. Such regulations have made investments by private capital unattractive.

The Water-Power Bill (H. R. 3134) which has just become law makes definite provision for the development of sites on the National Forests, and eliminates many of the disadvantages enumerated above. A Federal Power Commission, consisting of the Secretaries of War, Interior and Agriculture, is appointed, which has very broad powers regarding all use of the waters subject to regulation by the United States. Licenses will be issued for a period of fifty years, and are revocable only after civil procedure in the federal courts. The passage of this bill will, undoubtedly, stimulate greatly the development of water-power projects on the public domain.

State and Municipal Forestry and Water Resources

Where power shortage exists, and power companies are unwilling or unable to extend their plants, the question of municipal and state enterprises becomes important. Adequate power is so essential to the development of any territory that a municipality or state can afford to expend large sums in water-power developments with a much less return the investment than a private company, since the difference is the intangible return from the possession of power which attracts industry to the city or state. The development having been made, the operation of it to supply power is most economically made by long-term lease to a public utility company.

The enactment of the national Water-Power Bill is of vital concern to all states, since the powers of the National Government under the terms of this bill are so sweeping as to seriously affect state control of its water-power resources unless certain provisions are made. It especially behooves states or municipalities containing National Forests or the headwaters of navigable streams within their boundaries to act quickly to preserve to themselves the administration and control of water-powers situated therein. The Power Commission is authorized to issue licenses for and administer the operation of water-power developments on the "navigable waters of the United States, or upon any part of the public lands and reservations" (including National Forests), and to direct the "construction, maintenance and operation of headwaters or other improvements of streams upon which the Commission is authorized to issue licenses." This means that a farmer desiring to erect a 150-horse-power mill on a small stream tributary to a navigable river must have a federal permit, or find his enterprise stopped or modified by federal regulations.

The act further provides that applicants for federal licenses must have "complied with the requirements of the laws of the state or states within which the proposed project is to be located, with respect to bed and banks and to the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting and distributing power"......and that nothing within the act "shall be construed as affecting or intending to affect or in any way to interfere with the laws of the respective states relating to the control, appropriation, use, or distribution of water used in irrigation or for municipal or other uses, or any vested right contained therein." For states not provided with laws relating to water use or water-power the act provides "that in case of the development, transmission, or distribution, or use in public service of power by any license hereunder, or by its customer engaged in public service within a state which has not authorized or empowered a commission or other agency or agencies within said state to regulate and control the services to be rendered by such licensee or by its customer engaged in public service, or the rates and charges of payment there-

DAM AND RESERVOIR OF LARGE POWER COMPANY WITHIN A NATIONAL FOREST for........jurisdiction is hereby conferred upon the commission......to exercise such regulation and control until such time as the state shall have provided a commission or authority for such regulation and control." Moreover, the bill specifically provides especially favorable terms for state or municipal developments on the National Forests.

Excellent as the provisions of the act are in furthering water-power development in the United States, it is evident that such states as do not have conservation commissions, a Geological Survey, or other agency authorized to investigate and regulate the use of the water-power in that state are likely to be at great disadvantage. Certain states have near their boundaries great water resources. If these are developed by extra-state corporations and the power transmitted to the adjoining state for industrial use, the owner state loses the utilization of a valuable natural resource. If a city is situated near a National Forest, a private manufacturer may use the water resources of the forest under federal license, and the municipality desiring to extend its power facilities or water-supply may have to go a great distance and be at great expense to provide what it should have available near at hand. It is evident that the provisions of the Water Power Bill are eminently fair and favorable to states and municipalities, but they must be provided with the administrative machinery to preserve and utilize their water resources. Several states, not so provided with water use laws or commissions for their enforcement have recently been stimulated to provide them by the passage of the Water Power Act. Those states or municipalities having water resources of magnitude will do well to immediately investigate their potentialities, enact laws regarding their use, and provide a commission to investigate and regulate the development of power projects, whether or not these come under the provisions of the Water Power Bill.

Acknowledgement:—An address before the North Carolina Forestry Association, Asheville, N. C., June 10, 1920. Photographs by courtesy of U. S. Forest Service.

The Country's Smallest Public Park

By Allen H. Wright

TO the city of Visalia, Calif., is said to belong the honor of having the smallest public park in the country—if not in the world—which has been officially dedicated and named. It is called Askin Park, after a former mayor of the city, whose wife was appointed the official custodian.

The park is surrounded by a concrete curb. In its center stands a majestic oak tree, and to save this tree, at the time of grading Main Street, the plat of ground about its base was made a public park, as otherwise the tree, standing in the street, might have had to come down.

ASKIN PARK, VISALIA, CALIFORNIA

Blazing A New Trail Through the Wilderness

Road Building in Arkansas Opens New Country for Development

By Harold T. Macfarland

CHIEFLY instrumental in the present progress of Arkansas are the good roads which the state is building in almost every county. Sections not yet developed, sections virtually denied all opportunity for development in the past, now have the opportunity to advance with the rest of the nation, their residents in easy contact with other communities, their markets nearer, in point of transportation, by many hours and even days, their social life no longer restricted. Through the medium of modern highways being constructed at the expense of millions of dollars, vast agricultural areas are being opened up, great timber reserves are being made available to loggers and shippers.

Eighty-five hundred miles of good roads are planned by Arkansas, and many of them are already under way. Bond issues to finance the improvements have been authorized, and many of the bonds have been disposed of. Road building in parts of Arkansas differs mightily from the average construction in the East, or the Middle West. Among the most pretentious of the highway improvements in the state is the Arkansas-Louisiana Highway, a $3,500,000 project which now is nearing completion. Stretching for more than 153 miles through the extreme southeastern section, this road pierces the river-bottom or delta lands along the Mississippi, which are among the most fertile lands in the United States.

Pioneer railroad builders faced no more gigantic task than did the forces that have met successfully the obstacles in the construction of this highway. Through lands which lacked even a wagon road or path, parts of the highway were constructed with the aid of tree fellers, stump blasters and grubbers. Drainage problems were encountered on a stupendous scale, for in former years the whole of this delta land was under water for long periods each year. More than 40 per cent of the new highway was laid through districts where the chief soil was "gumbo" or "buckshot," a thick, black mud.

The Arkansas-Louisiana Highway starts

THIS BARBAROUS STRETCH OF ROAD WILL BE REPLACED BY A HARD-SURFACED HIGHWAY at Grady, a small town a few miles north of McGehee. At McGehee the road splits into three parts: the one to the east leads to Arkansas City, the second swings into the hill country of Drew County, and the third follows the line of the Mississippi levees to the Louisiana state line, where, at Arkla, it terminates. It is the third branch that traverses the most fertile and the wildest section of Arkansas, and one of the truly wild districts of the United States.

On a 5-inch concrete foundation, scientifically drained, a 2-inch wearing surface of Bermudez asphalt has been laid. This form of construction extends for 113 miles. The rest of the highway is macadam built with broken trap rock or gravel. The paved highway is 13 feet in width, with 6-inch concrete headers on each side of the road. The road-bed generally is 22 feet wide, and the right of way varies from 40 to 75 feet.

Pile and frame bridges were employed in the construction, to be replaced later by more permanent structures. Miles of deep side ditches, and many drainage openings of reinforced concrete, are employed in the drainage scheme.

The first survey for this road was made in 1917. Construction work was commenced during the summer of 1918, and the road will be finished this year, according to present plans.

For this highway between cotton fields and through forests, past tumble-down shacks occupied by negroes and through more than two score tiny settlements, an immense amount of material was required. Three hundred and fifty-one acres of ground had to be cleared, and on 370 acres grubbing was necessary; 752,440 cubic yards of excavation work was performed. The following statistics will show the extent of the operation:

Concrete in culverts, cubic yards..........	5,800
Foundation excavation, cubic yards.......	10,200
Reinforced and I-beam steel, pounds........	260,000
Concrete roadway header, lin. feet..........	594,350
2-inch asphaltic concrete surface, sq. yds..	850,500
5 inch concrete base, square yards........	850,500
Piling, lin. feet	11,500
Timber, M. B. M.	160
Gravel macadam, square yards.............	234,800
Trap rock macadam, square yards.........	97,700
Trinidad Lake asphalt, tons	800

The engineers were Ford & MacCrea, of Little Rock. The Bryant Paving Company, of Waterloo, Iowa, and the White Construction Company, of Chicago, were the contractors. Mechanical mixers, industrial railways and other up-to-date equipment were employed with marked success on the highway.

The Arkansas-Louisiana Highway is designed to form a link in a series of highways extending from Little Rock to the Gulf. Louisiana is planning a highway which will traverse the state.

Truck Transportation Needs Good Roads

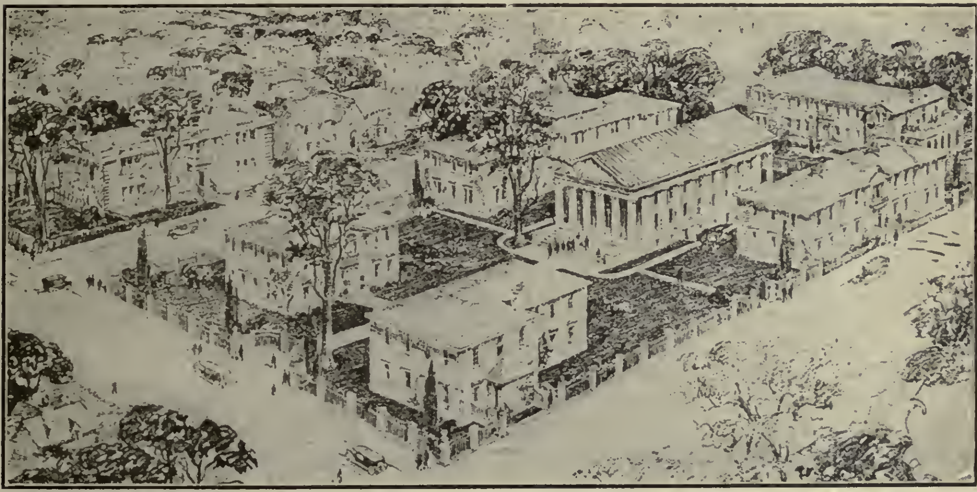
A HEAVY LOAD ON A MUDDY ROAD IS A PROBLEM FOR ANY TRUCK

An Ideal City Health Center

A Remarkable Group of Buildings Proposed for Norfolk, Va.

THE Public Health Department of Norfolk, Va., has made plans for the carrying out of health relief work in that city in a most progressive and ideal way. Many cities have established and are operating public health centers where all clinical, special welfare and health relief work can be unified, but no other city has carried out the project so extensively as Norfolk is planning to-day.

Dr. P. S. Schenck, Director of Public Health, has for many years been developing plans for a public health center for Norfolk. Judge William Day of the Juvenile Court is reported to have interested wealthy citizens in the project to such an extent that a large amount of money has been secured to definitely push the work. Proposed plans for the series of buildings have been drawn by Maxwell Hyde of New York, which, if carried out, will give Norfolk front rank among cities in this country in this important health movement. As far as is known, this is the first complete and comprehensive health center planned for this country which at the same time is related to, and has as a part of the group, the Juvenile Court and Detention House.



Litho print courtesy of Modern Hospital

PERSPECTIVE OF PROPOSED HEALTH CENTER FOR NORFOLK, VA.

The accepted plan comprises the following buildings:

Court House.—This is the old Academy building remodeled to meet the needs of the Juvenile Court and the Court of Domestic Relations.

The Detention Home.—This building will house the juvenile dependents and delinquents until they shall be permanently committed or other disposition made of their cases by the court.

The Emergency Hospital.—This structure is the police or accident hospital and has little relation to the health center as such.

The Pre-Maternity Building.—This building, which is called by some "The Children's Building," is where the prenatal work and also the work of pediatrics of any children up to those of school age will be carried on.

The Administration Building.—This building includes the laboratories and the office of the health administrator of the city and his staff, the central administrative office and record office of the health center.

The General Medical Building.—This building houses all the clinics and is the center of the active dispensary work.

In designing this project, the architects attempted to keep in mind the importance of not changing the character of the design of the old Academy which has been for a long time a landmark of this neighborhood. As far as possible the exteriors of the buildings have as little of the institutional aspects as possible. The colonial domestic type was adopted, as it lent itself well to this purpose. The wear and tear on buildings of this character is very great, so they are to be constructed of the most substantial materials, making rather a large initial expense, which is compensated for by economy in up-keep, repair and safety in case of fire. The central heating plant is to be installed in the basement of the Detention Building and will furnish heat for the entire group.

The Court House

The Court House will, when remodeled, have on the first floor the court room, the judge's office, waiting-rooms for whites and blacks, and the necessary offices for probation officers. In the basement are the detention rooms for those who are awaiting trial. The substitution of a detention room for the usual cell is a plan which has the hearty approval of distinguished authorities on penal institutions.

The rooms for the psychiatrists are attached to the court in the basement. On the second floor is located a meeting-room with a seating capacity of about 250 people which it is proposed to use for various meetings in connection with public health activities, parents' meetings and other activities of general public interest. This room can be used for instruction purposes when the lecture room in the children's building is not large enough. It will also serve as the exhibition room, which is essential in any public health campaign.

Detention Building

This building is the result of close cooperation and the experience of many institution heads in various parts of the United States, whose advice and criticism was sought and embodied in the final plans. The difficulty in planning a detention building is to arrange for the large number of segregations which it is necessary to make without having too large a building. This was cared for by making not less than seven segregate units. The basement of this building is to contain the heating plant for all the other buildings, the necessary storerooms, and the janitors' closets.

On the first floor is the general office, the waiting-room, the examination room, where the doctor examines all incoming cases, and the receiving bath and toilet. There are two living-rooms and two classrooms so arranged that by means of folding doors two large rooms will result. These can be arranged for technical training or any other purposes. There are two dining-rooms and a large, well-ventilated kitchen. Two play porches are important features of the structure. The second floor contains the living quarters for the superintendent, and the various bedrooms and dormitories. One of these rooms is to be set apart for those cases needing special study and observation.

Emergency Hospital

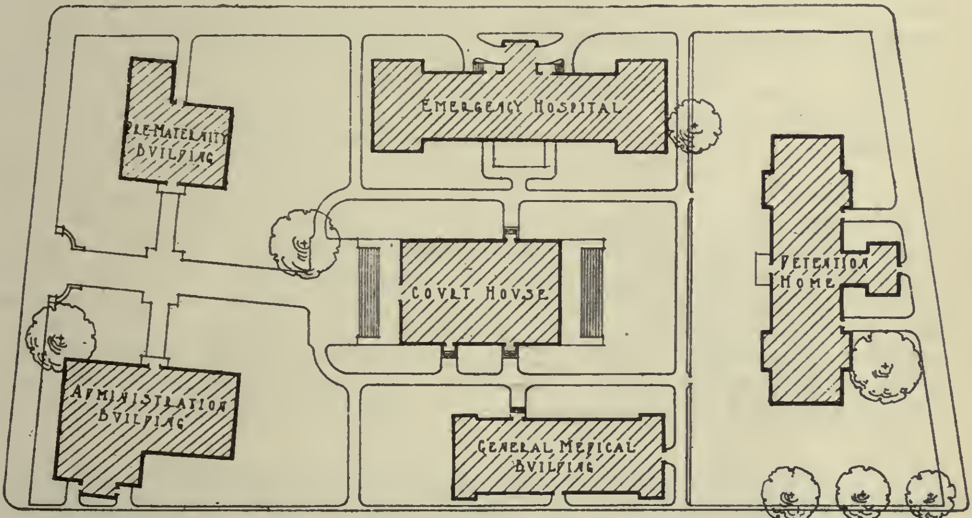
The Emergency Hospital is essentially a police hospital for accident cases. It is not intended to be an organic part of the health center. A room for children has been provided to take care of such tonsil cases as may come to the clinic, where it is found necessary to keep the child over night. The first floor is devoted entirely to the receiving-room, nurses' quarters, administration purposes, and the kitchen, diet kitchen, etc. The ambulance receiving-room is to be so arranged that minor surgical dressings can be done here and the patient immediately discharged where possible. In the basement is to be located a space for the ambulance and room for its attendant, also sterilizing-rooms, storage, etc. The second floor is divided into two sections, one for whites and one for blacks, and again subdivided for male and female cases. There are five private rooms which are not essentially "private" but are to be used for cases needing isolation and more quiet than could be found in the dormitories. On this floor is also the recovery porch with southern exposure. The bed capacity of the hospital is thirty.

On the third floor is a complete operating unit, consisting of operating-room, sterilizing-room, anesthetic room, doctor's office and wash-up room. The operating-room faces north, and the entire unit is well ventilated and isolated.

Children's Building or Pre-Maternity Building

The Pre-Maternity Building is to be used both as a maternity center and also for pediatric work for children up to school age. In order to make the building have as homey an appearance as possible, and overcome the diffidence of some women in going to large institutions, it has been designed more with the appearance of a large cottage than a clinic. The interior is to be brightly decorated, the furniture comfortable and domestic in character, placed as informally as possible, and the entire atmosphere friendly and homelike.

The visitor can enter by the front door or by the more private entrance at the rear. She enters a large waiting-room where she is met by a social worker who takes her history before ushering her into the doctor's office. Adjoining the waiting-room is a nursery where the children who so often accompanying the visiting mother are to stay while she is in the building.



PLAN OF HEALTH CENTER AT NORFOLK, VA., SHOWING RELATIVE POSITIONS OF BUILDINGS

There is a large lecture room for instruction purposes. A large plate glass permits those in the waiting-room to watch what is going on in the lecture room. This stimulates their interest and curiosity and they are only too anxious to get the much-needed instruction. The lecture room is to be equipped with the necessary sinks, table, scales, etc., and around the walls are open shelves for the display of babies' garments and fabrics, so arranged that the women can have easy access to them. It has been found that the interest in the display of inexpensive, dainty clothes for infants will bring the mother back again and again.

After the woman's history has been taken, she is conducted to the dressing-room with its necessary appointments, where she is prepared for examination in either of the two doctor's offices. These two offices are so arranged that they can be used not only as examining offices but also for treatment rooms.

On the second floor is another dressing-room and two more doctors' offices. A room is provided where the visiting nurses can prepare their reports and keep in touch with their cases. Here also is a model flat, consisting of combination kitchen and living-room, bedroom and bath. This is to be furnished with carefully studied and well-selected furniture and equipment in order to teach the women that it is not necessary to spend large amounts of money if knowledge and care are used in the buying. Each article is to be carefully marked with its purchase price. The bedroom can also serve the double purpose of rest or recovery room as may be required. It is also proposed to use the lecture room on the first floor as an instruction room for midwives, an essential part of any constructive maternity work.

Administration Building

This building contains on the first floor the drug dispensary with waiting-rooms for whites and blacks. It has a separate entrance so that those using it have no connection with the administration part of the building. A dumb-waiter leads to a room in the basement where material can be kept in bulk. A space is provided for the doctor who does the school vaccinations.

Space is also provided here for the general information office, the general record room, and the large room where the field force of the city health department can prepare its reports. On the walls of this room are cabinets for the health records and reports and for the keeping of the necessary literature distributed by the city health department. On the second floor are the executive offices of the city health officer and adjoining it the general office for the health department of the city. Here also is the laboratory for the city and the health center, with the necessary adjacent preparation rooms and glass washing rooms. On the roof are the animal rooms used in connection with experimental work done in the laboratories.

General Medical Building

In the General Medical Building are located the various departments which comprise the general medical and examination work and the dispensary work of the health center, exclusive of the work for children of pre-school age and for prenatal work.

The basement contains a complete X-ray department where it is proposed to do not only the X-ray work for the health center but also for the private physicians of the city. The experience of Bridgeport, Conn., is that this work not only carries the expense of the X-ray department but also shows considerable profit. The rest of the basement is devoted to the orthopedic department, comprising mirror and gymnastic room, general orthopedic apparatus rooms, foot-baking room, dressing-room and doctor's office. The general toilets for men and women will also be on this floor, as well as locker rooms for the attending physicians and nurses.

In order to avoid too large a plant for this building, it has been so designed that the same spaces can be used for various purposes at different times. It was also decided after careful consideration that in addition to the general waiting-room on the first floor it was advisable to have secondary waiting-rooms in connection with the separate departments. The visiting patient enters a large, well-lighted and ventilated waiting-room. In the center, controlling the entire room, is the desk where the first record is taken and the patient given necessary directions. To the right is the genito-urinary department, so arranged with a separate entrance that it can be used at night as a male clinic when the rest of the building is not in use. This same space can also be used as the gynecological department. It consists of a waiting-room, doctor's examining-room, four treatment rooms, arranged so that seven patients can be treated at once. In addition there is a microscopic room so that tests can be made immediately and the results given to the patient without delay. The stairs leading to the tuberculosis department are so placed that if there is need for a heavy service, the tuberculosis rooms can be used in connection with the genito-urinary section.

X-ray work for this department is to be done in the basement. One of these rooms can be used as a cystosçopic room. To the left is the general medical department, consisting of doctors' office, service room with sink, sterilizer, instrument cases, cupboards, etc., and six examination or treatment rooms, as may be required. The character of use and arrangement of time of use of this department will have to be decided by the medical authorities administrating the health center.

There are two stairs leading to the second floor, one for general use and one to serve the tuberculosis department. For this division there is a separate waiting-room, a doctor's office and three examination rooms. The other stairs serve the dental department as well as the divisions for eye, ear, nose and throat. Three dental rooms are provided, one of these being a sound-proof extraction room. There is an eye-testing room, sufficiently large to test a number of cases at once, a treatment room for eye cases, a doctor's office and small operating-room, and a general ear, nose and throat treatment room which is to be partitioned off so that a number of cases can be given simultaneous treatment.

Acknowledgment.—Prepared from papers by Mrs. Ruth Drew in *Greater Norfolk*, April, 1920, and Maxwell Hyde in the *Modern Hospital*, June, 1920.

TYPE OF ELECTRIC VEHICLE USED IN PATERSON, N. J., FOR COLLECTION PURPOSES

Comparative Costs of Collecting Ashes and Garbage

Electric Tractors, Horse-Drawn Wagons, Gasoline Trucks and Dump Carts Compared

An interesting comparison of the cost of operation of electric tractors with trailers having a capacity of 10 cubic yards each, horse-drawn wagons having a capacity of 3 cubic yards each, gasoline trucks having capacities of 7 and 10½ cubic yards each, and ordinary dump-wagons in use in Paterson, N. J., is given in the report of the Board of Public Works of that city by H. J. Harder, City Engineer.

Electric tractors, as shown in the illustration, collected a total of 55,401 cubic yards in 1919, the maximum haulage being in December and the minimum in January of that year. The average cost per cubic yard, including labor, was 45.42 cents per

THE ELECTRIC TRACTOR AND DUMP BODY IN DUMPING POSITION yard, showing a maximum in February and a minimum in January.

The horse-drawn wagons collected a total of 81,360 cubic yards, the maximum in December and the minimum in June, the average cost per cubic yard being 53.73 cents, reaching a maximum of 71.67 cents in June and a minimum of 45.39 in March.

Gasoline trucks collected a total of only 5,522 cubic yards of ashes and garbage during the year, because from the month of April to November inclusive the gasoline trucks are converted into flushers. The maximum yardage collected in one month by these trucks was 2,291 cubic yards in January, and the minimum, 598 cubic yards, in March. The average cost per cubic yard was 53.53, the maximum, 86.35, being in March, and the minimum, 40.2, in January.

The accompanying table shows the cubic yards collected by months and a statement of the total cost and cost per cubic yard for each one of the collecting vehicles.

ELECTRIC TRACTORS

Month	Cu. Yds.	Av. No. in Service per Day	Av. No. of Loads per Day Each	Total Cost	Per Yd.
January	2,821	2	5.31	$960.35	.3404
February	3,460	2.83	4.79	2,674.86	.7730
March	3,630	2.71	5	1,764.84	.4861
April	5,060	3.88	4.85	3,171.58	.6268
May	4,810	4	4.63	1,864.36	.3876
June	4,960	4	4.52	1,698.83	.3425
July	4,950	3.85	4.7	2,244.28	.4533
August	4,590	4	5.3	1,901.92	.4120
September	4,820	4	4.6	2,508.42	.4050
October	5,210	4	4.8	2,259.07	.4336
November	5,280	4	5.16	1,939.53	.3673
December	5,810	3.82	5.46	2,179.96	.3752
Totals	55,401			$25,168.00	
Unit Cost per Cubic Yard					.4542

HORSE WAGONS

January	10,841	17.92	7.37	$5,464.28	.5040
February	9,314	17.18	8	4,653.20	.6430
March	9,909	16	8	4,497.48	.4539
April	7,786	13.39	7.54	3,895.20	.5002
May	5,483	10.22	6.44	3,284.66	.5990
June	3,333	7.44	5.72	2,388.76	.7167
July	3,622	6.92	6.44	2,236.36	.6174
August	3,467	6.91	6.15	2,209.33	.6373
September	3,627	7	6.54	2,220.00	.6120
October	5,122	9.33	7.1	3,116.00	.6083
November	7,777	13.64	7.48	4,138.50	.5321
December	11,079	16.17	7.28	5,610.81	.5109
Totals	81,360			$43,714.58	
Unit Cost per Cubic Yard					.5373

GASOLINE TRUCKS

January	2,291	2	5.81	916.99	.4002
February	1,893	2	5.65	920.17	.4861
March	598	2	5	516.42	.8635
April					
May					
June		Gas Trucks are converted into flushers during summer months.			
July					
August					
September					
October					
November				136.00	
December	740	1	5.70	466.50	.6304
Totals	5,522			$2,956.08	
Unit Cost per Cubic Yard					.5353

Schoolhouse Fire Hazards

Fire losses on schoolhouses have been excessive for a number of years and are steadily increasing. Because of this fact, the experience of the insurance companies on this class was collated recently, and it showed that for the five years ending with 1917 the loss ratio has been 75 per cent. This means a heavy deficit, and, in consequence, an increase of rates on school property is inevitable.

Modern educational methods have greatly increased the schoolhouse losses through their introduction of new hazards. Manual training departments practically bring the factory hazard into the buildings in which large numbers of children are housed. Kitchens are provided for the domestic science department and for the serving of meals to the pupils. Moving-picture machines are in general use for educational purposes and entertainment, and the chemical and physical laboratories all present serious fire hazards. In addition, there is the increased use of school buildings as social centers for parties and dances and public meetings, involving the cigar and cigarette hazards, due to the carelessness of spectators.

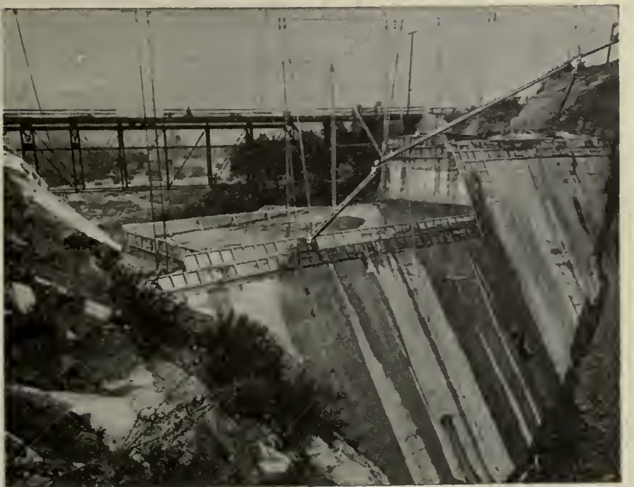
Controlling the Floods of Los Angeles County

How Motor Trucks Helped in the Construction of the Big Dam, which Impounds 6,600 Acre-Feet of Water

DEVIL'S GATE DAM HAS A STORAGE CAPACITY OF 6,600 ACRE-FEET

WATER, like fire, is a source of great blessing, but in many locations it must be controlled or it will be just as great a source of damage. The waters of Los Angeles County, Calif., coming down from the mountains, cause floods that for years have done considerable damage to property in the various flood districts. Realizing the need of action to control these floods, the California Legislature adopted the Los Angeles County Flood Control Act, in 1915, and this was later adopted by the Board of Supervisors of the Los Angeles County Flood Control District. J. W. Reagan was engaged as engineer to investigate carefully the best plans to control the flood and to conserve such water for beneficial purposes. These plans were, in brief, as follows:

First, the construction of both large and small dams in the mountainous areas; second, the protection of the banks of the smaller streams together with the spreading and storing of the waters of these streams for beneficial use; third, the straightening and rectification through river training and bank protection of the major streams, and fourth, protection to the harbors and shipping interests.



AN EXCELLENT VIEW OF THE SIDES OF THE DAM. THE ESTIMATED COST IS $209,000

One of the projects was at a point where La Canada-Verdugo Road crosses the Arroyo Seco, locally known as "Devil's Gate." Here was to be constructed a concrete masonry dam, 130 feet high, which would impound 6,600 acre-feet of water.

The amount of $3,600,000 was designated for this control work, including the "Devil's Gate Dam." However, before the work could be well under way, landowners, bankers, civil and commercial organizations represented that realty values were so depreciated on account of the damage by flood waters that the amount must be increased, if necessary, to correct this damage. In fact, so valuable were the dams in the minds of the people, that the engineer was able to secure all rights of way for channels without a cent of cost to the district.

DEVIL'S GATE DAM REQUIRED 600,000 SACKS OF CEMENT

The following facts regarding the "Devil's Gate Dam" will show the extent of the project. The dam is made of plain concrete or cyclopean masonry containing large stones, the top being 130 feet above the solid bed rock. For stability the dam depends entirely on the force of gravity; for added strength, however, it is arched up-stream in plan to a radius of 400 feet. In addition to the duty of this structure as a dam, it carries over its top La Canada-Verduga Boulevard, with a 20-foot roadway, and sidewalks on either side. This roadway is wide enough to carry a street railway should the necessity arise.

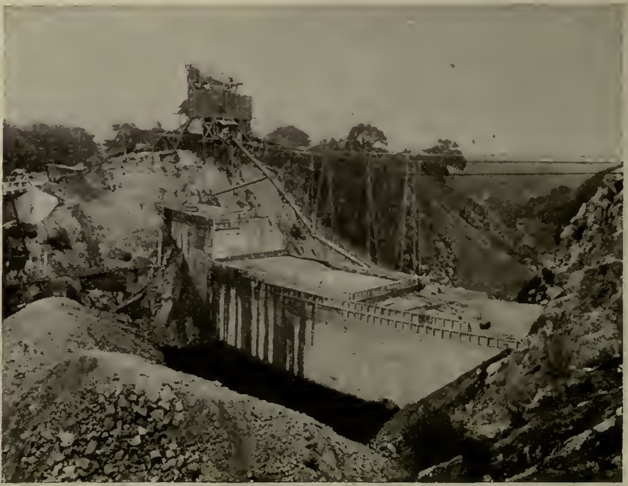
The storage capacity of the reservoir created by this structure is 6,600 acre-feet, the principle being for joint conservation and flood control. Its discharging apertures are controlled by hydraulically operated gates which are large enough to release 7,000 cubic feet of water per second. This volume is considered the maximum safe carrying capacity of the natural channel of the Arroyo Seco below the dam.

The surplus of any storm greater than 7,000 feet will be retained in the reservoir, as it is large enough to reduce 7,000 second-feet, the flood of a storm 50 per cent greater than the storm of February, 1914. The dam and reservoir not only give flood protection to the city of Los Angeles and a material reduction to the flow of the Los Angeles River in flood times, but conserve the stored flood waters of the Arroyo Seco for the beneficial use of the city of Pasadena and other cities of the southeast.

The top of the dam is 1,069 feet above mean sea level. The estimated cost of the completed work is $209,000; this is for construction alone, as the site was given free by the city of Pasadena and private owners.

The illustrations show something of the size of the dam. Such a structure requires a vast quantity of material, and more than 600,000 sacks of cement were used. This material was hauled from the railway station some miles away. The Selden truck operated by Smith & McCormick made regular trips on this work.

Because of the necessity of rushing the work on the dam, every effort was put forth to speed it up. The highest type of ma-



NOTE THE BROAD TOP OF THE DAM WALL. IT WILL ACCOMMODATE A STREET RAILWAY chinery was used and in keeping these machines and the scores of men busy, dependability of transportation was a very important and essential feature.

ACKNOWLEDGMENT.—Illustrations courtesy of Selden Truck Corporation.

The School Motor Bus Ignores the Weather

IN the old days when means of transportation were lacking it was necessary for the country children to trudge their way—often two or three miles, perhaps longer—to the nearest schoolhouse, and when weather conditions made walking out of the question the pupils were forced to stay away from school, thus hampering their chance of obtaining as good an education as existing circumstances would allow them to receive.

Nowadays conditions are quite different; good roads and speed-wagon busses make it much more efficient to take the pupils to centrally located grade schools. There they find teachers who are specialists; they are quickened by the competition of others of their own age, and they have the aid of modern equipment. Weather and road conditions do not prevent the pupils from being in school, for these busses run all year round—on good roads and bad, through snow-drifts and mud-holes, and never fail to make the trip and get the children to school.

A "cheap" education is costly.

Courtesy of Reo Motor Car Co.

A PAIR OF BUSSES USED BY THE RIVERSIDE CONSOLIDATED SCHOOL DISTRICT, CALIF.

Health Education an Essential

The health of children in school should not only be maintained, but it should, on the average, improve from the time that they enter the school if the teachers both teach and practice, as any rational system of education would require, the principle of health. Any school which sacrifices the pupils' well-being is a failure.

Summer or Winter the Motor Truck Serves the Community

INTENSELY COLD WEATHER DOES NOT PREVENT AMERICAN-LA FRANCE MOTOR FIRE APPARATUS FROM SUCCESSFULLY COMBATING THE FIRE PLAGUE

A MACK TRACTOR FOR HAULING AN AERIAL, PART OF THE EQUIPMENT OF THE CHICAGO FIRE DEPARTMENT

BOONE COUNTY, INDIANA, FINDS THIS SERVICE MOTOR TRUCK ALMOST INDISPENSABLE IN ROAD WORK

A survey of the counties of the United States recently conducted by The American City shows that there are a great number of counties, particularly in the Central States, owning and purchasing 3- to 5-ton trucks for road building.

ONE OF THE MOST UNIQUE MOTOR VEHICLES IN EXISTENCE AND THE LARGEST PASSENGER-CARRYING MOTOR VEHICLE EVER BUILT

This bus was designed by D. W. Templin, Engineer of the Goodyear Company, for service in Akron, Ohio. It has 4 wheels in the rear, with tandem axle drive. Equipped with one of the newest types of street car bodies, with side entrance and exit, pay-as-you-enter arrangement, adjustable windows, upholstered seats, and electric lights, the 6-wheeler, seats 44 passengers and with standing room will accommodate 90. It is on giant Goodyear pneumatic tires and has a 60-cylinder, 75-horsepower engine.

Rural Schools That Serve Effectively

By R. P. Crawford

Associate Editor of "The Nebraska Farmer"

If we assume that half of the children of the country live in rural communities,—and this assumption is approximately correct—by all rights they should receive half of our attention.

We have now abandoned approximately 50,000 of our little one-room schools and replaced them by some 12,000 consolidated structures, which compare favorably with the great majority of our city schools. Probably three-fourths of these one-room schools have disappeared in the last ten years. A tremendous wave of consolidation has been sweeping the Middle West.

In order to ascertain just where we stand at the present time in this matter, we received telegraphic reports on June 19 from the leading states on the number of consolidated schools. State Superintendent L. N. Hines reported approximately 1,000 consolidated schools in Indiana on that date, and for strictly bona-fide consolidated schools, Indiana should probably be awarded the first place. Ohio reported 910 consolidated and centralized schools, which to all intents and purposes here are the same thing. Iowa, perhaps the newest arrival in this game, has jumped into third place with approximately 415 consolidations. North Dakota reported 543 consolidated schools, but in that state the law classes as a consolidation any school with two or more teachers and serving eighteen sections. It is, however, a remarkable record for that state. To all appearances, Iowa has edged Minnesota out of her rank, which on June 19 reported 310 consolidated schools. However, if relative farming conditions and settlement of land were taken into consideration, Minnesota would rank near the top, if not at the very top. Colorado, notwithstanding the mountainous country, reported 115 consolidations on June 19, and some of these schools are among the finest in the entire country. Massachusetts reported that 2,160 out of 2,972 school buildings have two or more rooms and that 96 per cent of the public school pupils in that state are attending schools of two or more rooms. There are many other states in this country that are beginning to forge ahead in the matter of consolidation.

A. O. Neal of the United States Bureau of Education reported thirty-three states in the United States with 8,404 consolidated schools, and that the best estimate the country over is approximately 12,000. It will be noted that the few states just mentioned

By courtesy of "The Nebraska Farmer."

THE SARGENT SCHOOL IN COLORADO. THE EQUIPMENT INCLUDES TEN MOTOR BUSSES, AND THE SCHOOL SERVES 100 SQUARE MILES OF TERRITORY. ON SUNDAY IT IS USED AS A UNION CHURCH AND SUNDAY SCHOOL above have approximately one-fourth of the consolidated schools in the entire country. Indiana alone has one-twelfth of the entire number, and up to this spring had abandoned approximately 4,000 or one-half, of its one-room schools.

In rating consolidated schools, the kind of buildings erected should be taken into consideration as well as mere numbers. There are some states that are little better off with consolidated schools, as far as equipment is concerned, than are some one-room and two-room schools that are not consolidated. In such states as Minnesota, Iowa, Ohio, Indiana and Colorado they are bona-fide consolidations for the most part, with good, substantial buildings, a large proportion with high school facilities, and transportation systems in connection with most of the schools. Before a state can lay claim to being a leader in consolidation, it should be shown that one-room schools are actually abandoned to form the consolidation, that high schools are maintained in at least a fair proportion of schools, and that transportation is furnished. If this is not done, many states, through peculiarities in law and classification of schools, might seem to be leaders in the consolidated school movement, when in reality states reporting far fewer consolidations would be actually ahead in real work accomplished.

How Consolidation was Fostered

How have these leading states been able to make such great strides in getting rid of their one-room schools? It is not such a mystery as one might suppose. Nearly every one of these states has had some special legislation that not only provided for consolidation, but helped the matter along. For instance, Indiana's law provides that every one-room school with less than fifteen pupils *may* be closed and that every school with less than twelve pupils *shall* be closed, provided, of course, that the typographical conditions make it possible to abandon the school. There you have one of the keynotes to Indiana's success in consolidation.

Likewise, Ohio has a law that when the average daily attendance of any school in the school district for the preceding year has been below ten, the school shall be suspended and the children transported to another school. These schools are designated in the law as consolidated schools in distinction to centralized schools where the proposition is voted on by the people. Our reports from Vernon M. Riegel, the State Superintendent in that state, on June 19, indicated that the number of consolidated schools was 600 and the number of centralized schools 310. A few years ago Ohio completely revised its entire system of school laws.

In Minnesota, the most important factor in promoting consolidation has been the excellent system of state aid. Minnesota can give practically every one of its consolidated schools $3,000 or $4,000 state aid every year and not miss it from its great school fund. Its system of making schools live up to requirements in every particular, from approving in detail the plans and requiring all consolidated schools to be modern, to the hot lunch which must be served every noon, is perhaps unequalled in this country.

Add to these factors which promote consolidation a few live advocates in every state, and you have a winning combination. For instance, in Colorado C. G. Sargent of the State Agricultural College has been talking consolidation for years. The same is true of Iowa with Macy Campbell of the Teachers' College, and Mr. Dick and Mr. McClenahan of the State Department.

In practically every case the state laws have not only made consolidation easy, but have also done something definite to promote it.

We can't sit down and wait for consolidation, any more than consolidation can wait for good roads. As one Indiana county superintendent told me a few days ago, "If we had waited for good roads before consolidating, we should have had neither schools nor the roads." Farming itself waits on education, and yet the more rapid the advancement in farming, the more rapid will be the advancement in education.

Acknowledgment.—From an address delivered before the Department of Rural Education, National Education Association, at Salt Lake City, July 6, 1920.

Snow Removal, Hauling, City Grading and Road Making

Every winter the question of snow removal is of vital importance to city officials, park commissioners, and industrial plants. The solution to the whole problem is in getting to work when the snow storm commences, and being able to clear the snow faster than it falls or drifts.

The "Caterpillar" Tractor is the one successful power method for removing snow from city streets and country highways. It meets every need for a highly effective machine capable of bucking snow drifts, ice, sleet, working fast and at a minimum cost.

The "Caterpillar" is powerful, fast and active. It works in crowded city streets, does not damage the finest road surface; instantly turns within its own length. Built to military standards it operates day and night if necessary, no matter how low the temperature.

Holt engineers have developed highly effective types of snow plows thus providing *a complete "Caterpillar" snow removal outfit.*

Investigate the "Caterpillar" at this time in preparedness against snow blockades during the winter months. Holt engineers are equipped to give thorough cooperation in all municipal snow removal and road building problems.

Our booklet *"Caterpillar" Performance* will be sent upon request.

The Holt Manufacturing Company

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Peoria, Ill.—Stockton, Cal.—Spokane, Wash.

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Municipal Finance

BONDING **ACCOUNTING** **TAXATION**

Municipal Budget Standards

THERE are two outstanding purposes to be achieved through a municipal budget. In the first place, the budget is the sailing chart for the administration. It is a plan of campaign drawn up for the approval of the elected representatives of the people by those who must carry on the city government. In the second place, the budget is a document of public information. It is the most important single statement laid before the public by the municipal authorities, because its central feature is the plan of action of the administration, reflecting in financial terms the services to be rendered by the city and the financial burdens to be laid upon the city.

The Budget as a Means of Public Education

The second outstanding purpose of a municipal budget is public education. Our whole system of government is based on the belief that the people can govern themselves better than anyone else can govern them. It is clear that the success of our experiment in democracy depends in the long run upon the intelligent interest of the people in the affairs of government. Now that our cities have become large and the public business extensive and complicated, it is necessary for the government to take active steps to keep the public informed. The city budget can and should be one of the chief means of arousing public interest and extending public knowledge about the affairs of city government.

The problem, then, is to make the city budget understandable by the average citizen. In approaching this task, the first thing to be remembered is that there is nothing more bewildering and uninteresting than columns and pages of figures. Therefore, as part of the budget, there must be a brief running story that explains the important features of the budget plan so that anyone can understand it. This must be followed by a comparatively few summarized financial statements showing the budget plan in its relation to past operations and to future tax levies. In support of the running story of the budget and the summary statements, there should be presented the detailed estimates, the fund and debt statements, and the proposed text of appropriation and revenue measures.

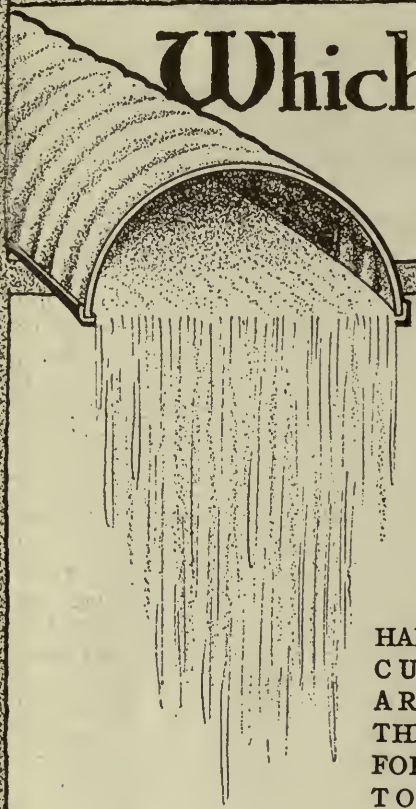
The sporting page of any newspaper presents a suggestive model for a city budget. Take the leading baseball story.. You will find a live text story of the high spots of the game supported by the detailed box score. Take the reports of a great football game. You will find a thrilling text story with a graphical presentation of the game and a number of pictures of the crucial moments supported by the line-up and the score by quarters, and this in turn by a detailed analysis of individual plays. We have talked of improving our governmental processes by following English models and German models and by adopting the methods of big business. Certainly in the effort to make our budgets interesting we must follow the suggestions of the American journalist.

In all of our cities the budget with its detailed supporting estimates should be published for distribution. A carefully prepared release should be drawn up for the papers, and interviews should be given to press representatives.

Before presentation of the budget plan to the legislative body for final adoption, a public hearing should be held. Responsible members of the administration should also avail themselves of every opportunity to explain the budget to the citizens in meetings of their regular civic, commercial, social and religious organizations.

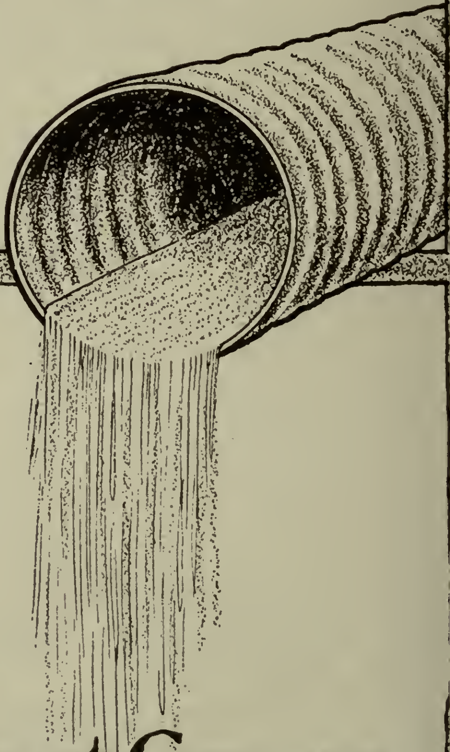
There is one more method of "putting the budget across" that should be mentioned, and that is the budget exhibit. Through such an exhibit in a temporarily vacant store or in the concourse of the city hall,

Which type of Culvert do you prefer?



WE make the Half-Round type of culvert from "Genuine Open Hearth Iron" and they can be readily used when the fill is not sufficiently heavy to permit the use of the right size of round riveted pipe for the capacity needed. The bottom sections can be had in lengths of 6, 8 & 10 feet, thereby giving a more rigid culvert than if the bottom were made of shorter sections. The top sections on the other hand are made in multiples of two feet.

HALF ROUND CULVERTS ARE JUST THE THING FOR CITY OR TOWN USE



ROUND Riveted Full Circle Corrugated Metal Culverts have come into almost universal use all over the country. Their value is well understood for general use on main highways; they are the best and are invaluable on secondary roads where the service demanded is much greater. Corrugated metal culverts made of any grade of material, are much more easily handled and installed than any other form of culvert construction; but where permanency has to be considered, it is well to have them of the best grade galvanized iron sheets that are on the market. Our "Genuine Open Hearth Iron" is the best. Send us your address so we can send you further particulars.

The Newport Culvert Company

NEWPORT 542 West 10th St. KENTUCKY

the administration can present through wall charts and through other concrete methods a large part of the outstanding information of the budget. The dry-as-dust figures can be converted into real pictures and objects which will serve to attract and enlighten public interest in budget problems.

Prerequisites of Planning and Control Through the Budget

The budget as a means of planning and control rests upon many factors. There cannot be a satisfactory budget system unless the municipal government itself is organized so as to make planning possible. A unified plan for the administration of the city government cannot be made by a series of independent governmental agencies. There must be a central executive with power to draw up a plan determining the proportionate emphasis to be laid upon the various governmental services. Our cities must have health service, schools, water, sewers, waste disposal, police and fire protection and the many other necessities of civilized urban life. We must have these things in proportion, and proportion demands a single plan which will include all services. It has already been recognized in the cities of the state of New York that the preparation of the budget should be entrusted to the chief executive. We have already applied in our cities, though not yet in our state government, the sound principle expressed by Alexander Hamilton in 1788 when he stated: "The preparation of the plans of finance falls peculiarly within the province of the executive department." The organization of the city government under a single responsible executive authority is a prerequisite of an effective budget system.

A second requirement of a sound budget system is freedom in planning. There can be no real budget planning, no planning that is of constructive value, in a city in which the restrictions placed upon the use of the cities' funds or upon the amount of tax which can be raised have been outgrown. The creation by statute law of specific restricted funds for each and every municipal activity has served to tie the hands of the administration to such an extent that its efforts are diverted from careful budget making to a policy of arbitrary allowances or to a scheming endeavor to find methods of evasion. It is clearly impossible to ask a city administration to draw up a sailing chart when the helm is tied fast with charter restrictions.

A third requirement of a sound budget is that the budget must be complete. It is impossible to make an adequate plan unless all the factors are considered together. Each of the services and projects to be financed must be considered in relation to all the other services and projects, and the need for funds must be balanced over against the available revenues, taxes and loans. When any of these elements are omitted from the budget, the budget becomes a partial plan and as such is only partially satisfactory.

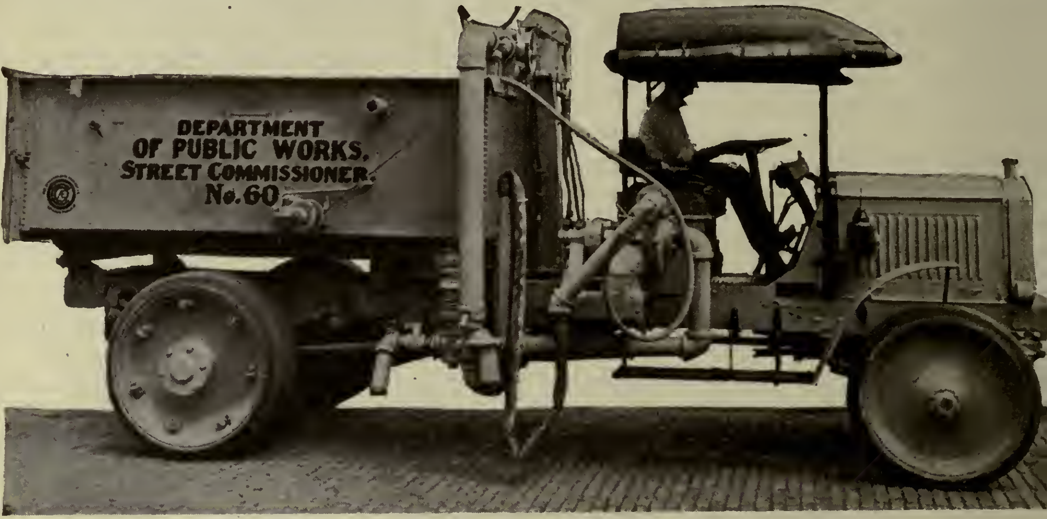
A further requirement is a complete and modern system of accounting. It is impossible to plan for the future without a thorough knowledge of the experience of the past, and without accurate accounts the municipal executive cannot know the financial condition of the city and the financial results of past operations. It is also through accounts, primarily, that budget control is exercised.

The standardization of supplies and the correlative classification of personal services and standardization of salaries are essential in a sound budget system. Sound planning involves a consistent salary policy throughout the entire municipal administration. It demands that clerks who are doing the same grade of work with the same loyalty and efficiency in the various departments shall be paid the same salaries and shall receive similar increments. The budget must reflect the salary policy and the supply standards of the city administration. If the administration has no well-thought-out plan along either line, its budget will fall short of being a completely worked-out plan for the city government. Because of the fact that salary and supply standards cannot be prepared, considered and adopted in the necessary rush of budget preparation, and because such standards need not be altered extensively from year to year, their formulation and adoption may be regarded as a prerequisite of a sound budget system.

The preparation of a municipal budget is no simple task. Even the smaller cities burn the midnight oil in jamming through the necessary work. There are estimates to be collected, corrected and tabulated, hurried conferences with department heads to

Otterson Auto-Eductor Cleans Catch Basins

Saves Time-Money-Labor



The Otterson Auto-Eductors are saving thousands of dollars yearly to the following cities now using them:—

Canton, Ohio, 1 machine
Danbury, Conn., 1 machine
Seattle, Wash., 1 machine
Portland, Ore., 1 machine
San Francisco, Cal., 1 machine
Chicago, Ill., 1 machine
Chicago, Ill., repeat order, 6 machines
Chicago Park Board, 1 machine
1917 Milwaukee, Wis., 2 machines
1918 Milwaukee, Wis., repeat order, 2 machines. Repeat 1 machine in 1920
Indianapolis, Ind., 1 machine
Indianapolis, Ind., repeat order, 1 machine
Louisville, Ky., 1 machine
Louisville, Ky., repeat order, 1 machine
Philadelphia, Pa., 1 machine
Newark, N. J., 1 machine
Akron, Ohio, 1 machine
Albany, N. Y., 1 machine
Brooklyn, N. Y., 1 machine
New Bedford, Mass., 1 machine
Providence, R. I., 1 machine
Providence, R. I., repeat order, 1 machine
Richmond, Va., 1 machine
Bridgeport, Conn., 1 machine
Bridgeport, Conn., repeat order, 1 machine 1920
Halifax, N. S., 1 machine

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Efficient, economical and sanitary in operation. Cleans catch basins in from four to twenty minutes:

Equipment mounted on any 5-TON Chassis of suitable standard make.

THE OTTERSON AUTO-EDUCTOR CO.
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be held, committee meetings to be attended, financial statements to be prepared, printer's proof to be read, difficult problems to be settled, differences of opinion to be reconciled, and a thousand and one other things to be attended to that no one would think of unless he had taken a hand in the actual preparation of a budget. In some cities the time allowed by charter is far too short. In others, the first steps are taken so long before the beginning of the fiscal year for which the estimates are made, that is is impossible to make valid plans. In still other cities the budget is not completed until after the beginning of the fiscal year, and for the first months the government continues without an authorized plan of administration; and, as Controller Evens has observed, the collection of taxes is so delayed that the city is driven to financing itself with temporary loans, the interest cost of which in this state amounts to from three to four million dollars a year. The budget cannot be a well-considered plan nor an adequate means of control unless the municipal financial calendar is set up to meet the needs of the budget.

The municipal budget becomes a means of control only on ratification by the legislative body of the city. This ratification is expressed in the appropriation acts, in the tax levy and in the other revenue and borrowing measures. In order to guard against the undue restriction of the executive, lump-sum appropriations should be made wherever complete executive responsibility is fixed. The determination of tax, revenue and borrowing measures should coincide with the determination of appropriation measures. These measures embody the outlines of the budget plan and should therefore be considered and adopted or amended as a unit.

The budget as reflected in appropriation and revenue measures cannot be a controlling plan unless it is made binding upon the administration. If the policies laid down in the budget may be altered from time to time at the whim of the administration, if appropriations may be increased freely, if surplus revenues may be expended at will, the budget becomes a farce. There is little value in going through the motions of preparing and adopting a municipal budget, unless the budget becomes a binding plan. While appropriations must not be so highly segregated as to cripple efficient administration, and while there must be a method of meeting genuine emergencies, it is essential that the city budget shall be a fixed and final plan of administration.

The execution of the budget—the expenditure of the city's funds, the collection of the taxes and revenues, and the negotiation of loans in accordance with the appropriation ordinance and the finance measures—must for the sake of efficiency be left to the executive. In order that the executive may be bound by the terms of the budget plan, there must be a financial officer independent of the executive and responsible for the current audit of all accounts and financial transactions. The budget cannot be made a means of effective control unless an independent audit is provided.

To sum up the conditions mentioned as essential to make the budget an adequate means of planning and control:

1. There must be a single executive authority.
2. The city administration must have freedom in planning.
3. The budget must be a complete plan.
4. There must be a modern system of accounting.
5. Salary and supply standards are necessary.
6. The financial calendar must meet the needs of the budget.
7. There must be legislative ratification of the budget as a unit.
8. The ratified budget must be a controlling instrument.
9. There must be an independent audit of the execution of the budget.

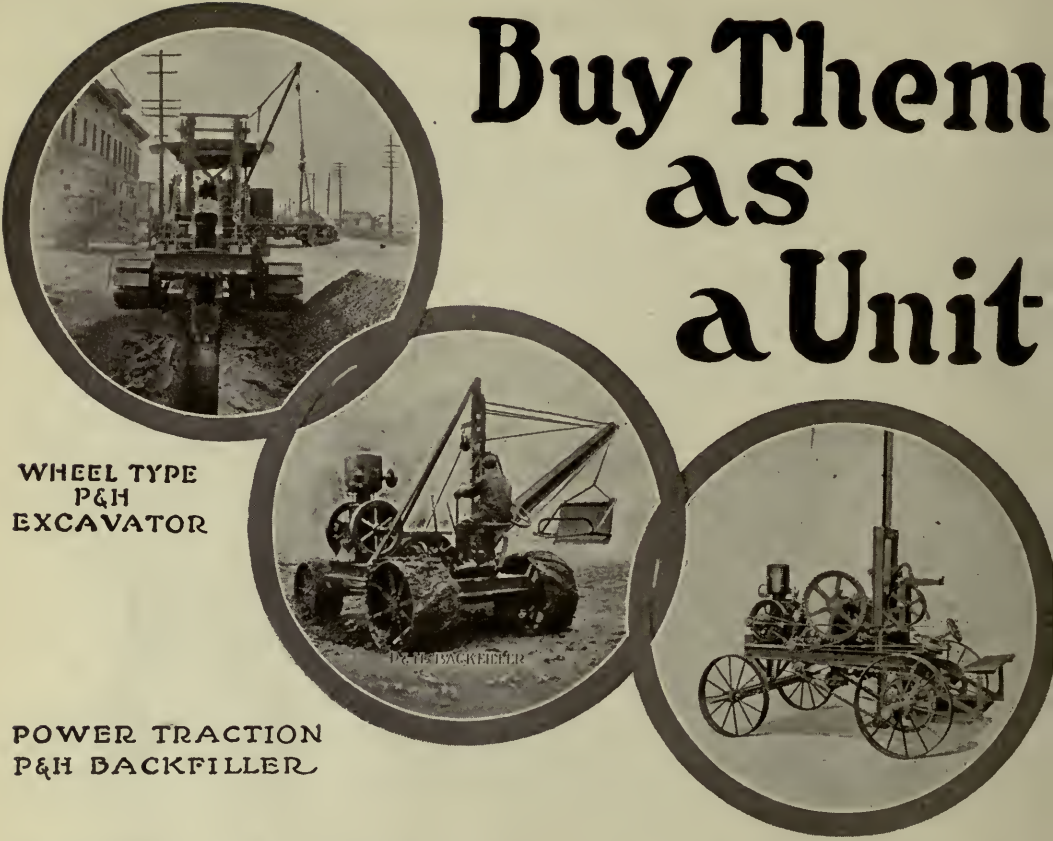
To summarize the essential methods of making the budget a more adequate means of public information, we may say:

1. The budget must contain a brief text story explaining the budget and calling attention to the questions of chief public interest in addition to the brief financial summary and the detailed supporting data.
2. The budget should be published for public distribution.
3. No effort to secure publicity for the budget, whether through the press or through public gatherings, should be overlooked.
4. There should be a public hearing on the budget.
5. A budget exhibit should be held by the city administration.

LUTHER H. GULICK,
New York Bureau of Municipal Research; Special Counsel, Special Joint Committee on Taxation and Retrenchment of the New York State Legislature.

Acknowledgment.—From an address delivered before the New York State Conference of Mayors and Other City Officials at Jamestown, N. Y., July 7, 1920.

Buy Them as a Unit



WHEEL TYPE P&H EXCAVATOR

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The purchase of a P & H Trenching Unit is a terse answer to the question of city trenching.

On city streets where work must be done with uniformity, and dispatch, the P & H combination —Excavator, Backfiller, and Tamper—is the logical equipment for the job.

Excavating: steady and fast with none of the irregularity and time consumption of human labor and at a cost that shows big in net savings.

Backfilling: getting the backfill back, and out of the way of traffic, in a hurry, and on one man's time.

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Real facts and figures on P & H Excavating Equipment are waiting for you, let us give some interesting and valuable data,—send for Bulletin X and Bulletin IX.

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50 Church Street, New York
704 Stephen Gerard Building Philadelphia
926 Whitney Central Building, New Orleans, La.
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1241 Monadnock Block, Chicago, Ill.
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"You see them wherever you go, and they go wherever you see them"

P&H —excavators— back-fillers - tampers

News and Ideas for Commercial and Civic Organizations

Tying the Home to the Community

Wichita Falls, Tex.—Emphasizing the common tie of neighborhood betterment and the promotion of wholesome democratic social life brings the people within a community more closely together and develops mere residents into real citizens. Realizing that Wichita Falls in its new era of growth in population is made up largely of newcomers, the Chamber of Commerce is endeavoring to tie the families throughout the city definitely to the community through the formation of block organizations and "block parties."

The discovery of oil in Wichita County is largely responsible for the city's increase in population from 8,500 in 1910 to approximately 45,000 in 1920. Naturally, the advent of so many newcomers brought about a social condition which was both gratifying to the statistical department and exasperating to the General Secretary of the Chamber of Commerce. It is impossible to hold a family whole-heartedly unless some sort of claim upon the home, including the wife and mother and the children, is established. The fact that the head of the family has a good business connection down-town does not make citizens of the entire family.

The Chamber of Commerce decided to bring the residents together in an old-fashioned town hall convention. Letters of invitation were sent to the names on the Chamber's membership list, and to a mailing list made up from the city directory and the telephone directory. The meeting was also advertised in the daily papers. The keynote of this foregathering was "more neighborliness." It apparently struck a responsive chord in every heart, and the spontaneous expressions of approval that came from the crowd indicated that human beings desire, above all else, pleasant associations with their fellows. One man stated that he had attended church many times during his two years' residence in the city and that he had made only one or two friends. "I know only four people in this audience," he said. "I do not know whether it is my fault or yours, but I want to know you. I was a citizen of the town I came from. I took part in lodge and church, school and chamber of commerce affairs. I do not want merely to live in Wichita Falls. I want to be a citizen. I am with you in this new movement."

One speaker related the story of Henry Grady, the Georgia orator, who told that on one occasion he and his wife were living in a New York apartment for several weeks. One morning he saw a doctor coming out of the house from one of the upper floors. In his small-town Southern way, trying to be neighborly, he stopped the doctor and said, "Doc, is someone sick here?" The doctor looked at him as if he thought he was a strange animal, and said briefly that a man was sick but that he did not know who he was or anything about him. After considering with his wife whether or not they ought to go in and sit up with the sick man, as was the custom in a little town, he felt the coldness and lack of neighborliness and decided that in the community into which he had moved it was not the custom to do that sort of thing. A few days later a coffin was brought down-stairs and borne away, with one or two vehicles attending. Grady accosted one of his fellow cliff-dwellers and asked him if someone was dead in the house. The other man, a typical city dweller, said he supposed so, as there was a hearse out in front, but he had never met the family up-stairs, did not know who they were or anything about them. Grady asked if he intended to go to the funeral. He said no. Grady's naturally friendly heart was appalled at this lack of neighborliness. He went back to his apartment and said, "Annie, let's go back to Georgia where they know when you get sick and care when you die."

Make no mistake about it, New York is

"The Slide for Life"

Remember when you played Conquer Leader, the daring "Slide for Life"—down the side of a hay-stack, maybe? Remember the zest you developed for playing the game, the ambition to outstrip your playmates, the courage to see things through to a finish?

Perhaps the children in your city cannot have hay-stacks to slide down. But they can have playgrounds; playgrounds fitted with the most modern and scientific play tools yet produced, where they can make their "Slide for Life"—build courage, ambition, and the desire to win—just as you did years ago.

MEDART
PLAYGROUND EQUIPMENT

For fifty years the Medart Company has manufactured and perfected gymnasium apparatus for vigorous men—an experience that has particularly fitted it for the leadership it has always maintained in the playground movement and in the development of playground equipment best suited to withstand the severe use and abuse of the children.

Catalogue "L" fully describes Medart Playground, Swimming Pool, Gymnasium and Locker Room Equipment. Contains valuable suggestions for playground installations. It will be sent gladly to anyone requesting it on their letterhead.

FRED MEDART MFG. COMPANY
Potomac & DeKalb Sts. St. Louis, Mo.

not alone in this class. There is too much of this spirit in all our American cities, and it was in the belief that it is a duty of the Chamber of Commerce to make the community a better place in which to live that this body undertook the block organization for neighborliness and for civic improvement.

At the first meeting referred to, the town was divided into twelve districts. A district convention was called in each of the districts and advertised through the newspapers and by means of letters sent out from the Chamber of Commerce. Speakers were coached to present the idea of neighborliness and civic improvement. A district chairman was elected at each convention, and an organization committee was appointed to carry the idea back to the blocks. The people in the blocks were invited to meet in block parties at the homes designated by the chairman of the district. At the block meetings, block chairmen and secretaries were elected.

The district chairmen are members of the senate of the Community Forum; the block chairmen are members of the house of representatives of the Community Forum. The Forum's general meetings are held at the Chamber of Commerce.

Aside from promoting social life and neighborliness, the Forum provides an efficient piece of machinery by which the Chamber of Commerce can communicate with every home in the city on short notice and enlist all the people in any movement for the good of the community.

The central committee having charge of the work was the City Betterment and Beautification Bureau of the Chamber of Commerce. This committee laid down very few rules and regulations, believing that any group of American citizens when gathered together will find their own best means of enjoyment and progress. As a result, these block parties have taken various turns in different parts of the city. As summer came on, the meetings were held on the lawns. Recently Community Service, Inc., sent a representative here to assist us, and many features of the work have been incorporated into the block organizations.

The movement has become very popular and appears to be solving one of the great basic problems in many cities: that is, it is making the people feel that the town belongs to them and that they belong to the town; that they have a duty to perform as citizens; and that citizenship is not only the making of a living but includes the making of a life.

HUBERT M. HARRISON,
Secretary, Wichita Falls Chamber of Commerce.

The Columbia Basin Reclamation Project

Spokane, Wash.—For the first time in their history, Portland, Seattle, Tacoma and Spokane have come together on common ground and joined hands in a common issue. The competition for trade territory among these busy, ambitious Pacific-Northwestern communities is of more or less common knowledge. The issue in which they have joined hands is the Columbia Basin project, that vast reclamation undertaking by which it is proposed to make nearly two million acres of arid and semi-arid land in central Washington blossom like a garden.

The Columbia Basin project had its beginning in the investigations conducted by state and federal engineers a quarter of a century ago. They ascertained by soil surveys that no lands in the United States are more fertile than these, and proved that in the magnificent stretches of Lake Pend Oreille there is an enormous storage and catch-basin amply sufficient for all require-

SAGE BRUSH LAND LIKE THAT SHOWN ON PAGE 319 YIELDS ORCHARDS LIKE THIS WHEN RECLAIMED AND IRRIGATED

Aeroplane view of Los Angeles, Cal.

How Los Angeles Figured Land Values On 400,000 Parcels of Real Estate

THE most impressive testimony to the practical value of the Monroe Calculating Machine in your field is the experience of the Joint Bureau of Appraisal, Los Angeles, California.

That progressive community faced the tremendous task of computing land values on 400,000 separate parcels of real estate.

Some job! But the Monroe did the trick. It simplified the work to such an extent that the highly pleased Superintendent enthusiastically writes:

"The work of computing land values for the City and County Assessors marks ***an undoubted triumph in the application and use of the Monroe.*** Without it, we never would have made the record of handling such a mass of detail calculations. The most striking feature was the ease and facility with which men who have never used such machines before became quite proficient in a few days."

What the Monroe has done for Los Angeles, it is doing in a proportionate degree for many other state, county and city governments—in the Tax Commissioner's office, Construction Department, Engineering Department, Water Department and other offices once burdened with a whole lot of bothersome calculations.

And what the Monroe is doing in other parts of the country it can do for you. Would you like to have a demonstrator call and prove it to you—in your own office—on your own work?

The coupon below is his invitation. Send it today.

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The "SHOW ME" Coupon-Mail it today

Monroe Calculating Machine Co., Woolworth
Bldg., N. Y.
Without obligation (check items desired)
☐ Send us a copy of "Book of Facts."
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ments under the most exacting conditions imaginable.

The climate, altitude and drainage slope in this section all lend themselves to maximum results from intensive cultivation upon the completion of the enterprise. Three transcontinental railroads cross the area to be reclaimed; there are splendid roads intersecting it in all directions, and settlement and agriculture reach to the very edge of the district.

E. F. Blaine, a Seattle resident of vision, revived the idea a few years ago at a conference with the Spokane Chamber of Commerce, and pointed his argument with the astonishing results that had been secured in the Yakima project, of which he was the father. Mr. Blaine said that what was gained in the Yakima undertaking—a return of more than $50,000,000 annually from an area of 300,000 acres—could be duplicated six-fold in the Columbia Basin. The suggestion fell on fallow ground, until the war came with its unprecedented demands, and the nation was found to be but a few strides ahead of a general shortage of food. The necessity for action then brought to mind Mr. Blaine's suggestion.

The Spokane Chamber of Commerce took the initial steps this time. Ultimately an appropriation was secured from the State Legislature, with a commission charged to determine the possibilities of the proposal. The federal reclamation authorities' interest was secured, and the work has proceeded. The preliminaries have been accomplished, and now the executive factors remain to be dealt with. To forward these, the cities of Seattle, Portland, Tacoma and Spokane, as said before, have joined forces. Their leading business men have put their heads together, and the organized business interests are solidly cemented in the determination to alter the status of the Columbia Basin project from promise to accomplishment.

The united effort of the four cities has crystallized into a weekly committee meeting participated in by all of them. Some members travel 350 miles and back to attend these sessions, but are always in attendance. The next big event scheduled in behalf of the project is the great Northwestern Irrigation Congress, to be held in Seattle September 16-17.

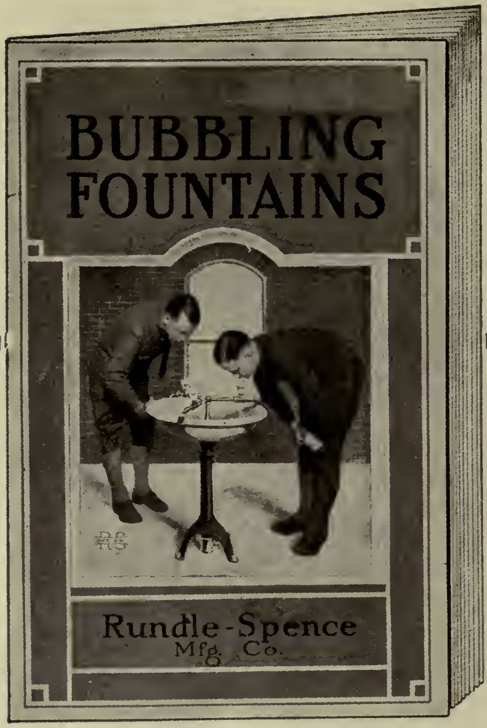
TYPICAL SAGE BRUSH IN THE COLUMBIA BASIN. CONTRAST WITH ILLUSTRATION ON PAGE 317

Aside from the great contribution to the prosperity of the Pacific Northwest and the nation, the Columbia Basin project gives every indication of teaching a lasting lesson in interstate and intercity coöperation and coördination.

MAJOR R. A. LAIRD,
Publicity Secretary, Spokane Chamber of Commerce.

Minot Association of Commerce Enlarges Quarters

Minot, N. Dak.—The rapid growth of the Association of Commerce of Minot, N. Dak., has necessitated the leasing of the entire second floor of one of Minot's office buildings. Remodeling is already in progress. The immediate cause for expansion is the addition of a Traffic Department, which opened for business this spring. There has also been a demand for membership meetings of the Association at stated intervals, and the assembly room was too small to accommodate the present mem-



CLEANLINESS SUPREME IN BUBBLING FOUNTAINS

For convenience and cleanliness in drinking the stream of minimum slant that insured all the water falling to one side is an improvement over both the vertical type and the streams slanting from 30 to 50 degrees for it cannot draw the falling water back into the ascending column and yet it possesses the copious drinking feature of the vertical stream and eliminates the inconvenience of the stream of decided slant.

The Complete Safety and Convenience of "Vertico-Slant" Fountains

The slight angle of the "Vertico-Slant" fountain obviates the necessity of a special valve for drawing water to fill a glass or cup as an individual drinking cup may be readily filled as from a faucet.

Finger contamination is practically eliminated, as the nozzle as located at the bottom of a recess protected by a wall on either side, discourages the attempt. This feature makes it possible to dispense with a protective shield as is necessary with many slanting jet fountains. The "Vertico-Slant" is so built that the nozzle cannot be touched with the lips. The free and open construction of the fountain offers no harboring place for germ life. By dispensing with the detachable drinking heads featured by some manufacturers and making the fittings so they can be removed only by one equipped with the necessary tools, tampering and pilfering are prevented.

The "Vertico-Slant" Fountain Overcomes All Objections

All "Vertico-Slant" Fountains are made with extra heavy vitreous china bowls, glazed inside and outside, sufficiently heavy to withstand abuse and, if chipped, will not show a rusty surface as is the case with enameled iron.

An essential element in the successful operation of drinking fountains is a uniform pressure and where there is a great variation, it is necessary that an approved type of water pressure regulator be used.

Full descriptive literature and a copy of our 1920 bubbling fountain catalog will be sent to any city officials or industrial plants interested, upon request.

RUNDLE-SPENCE MANUFACTURING COMPANY
MILWAUKEE WISCONSIN

bership. The new assembly room will be built out of the two assembly rooms now used by the Odd Fellows and the Association. It will be 45 by 45 feet, and it is expected that nearly the entire membership can be accommodated at dinners. When the hall is completed, a stage and dressing-room will be added at one end, and a kitchen will be equipped. The rest of the floor will be occupied by the administrative offices of the Association, and by the Traffic Department.

Four years ago the business of the Association of Commerce was conducted in two small rooms. When the new plans of the Association are matured, the organization will occupy a space 50 by 130 feet, all devoted to the business of building up Minot and the northwestern part of the state.

WILL E. HOLBEIN,
Secretary, Minot Association of Commerce.

A Phase of Public Safety

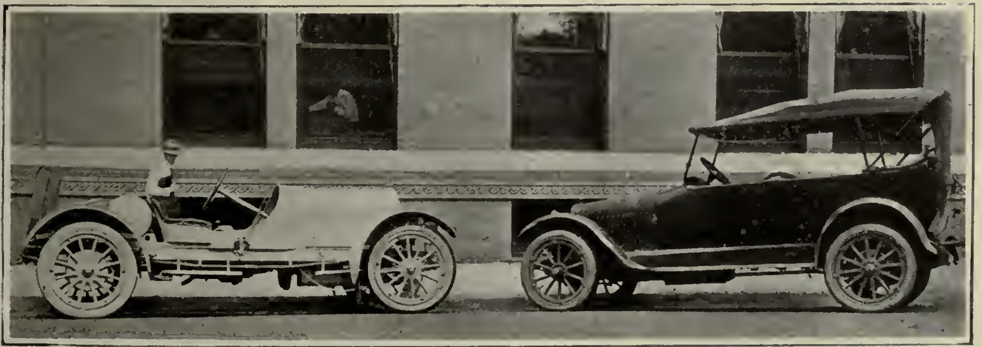
By Pierce Atwater

Secretary, Civic Division, Civic and Commerce Association, Minneapolis, Minn.

PRACTICALLY every active chamber of commerce is obliged to grapple with the problem of accident prevention. Automobile and other vehicular traffic is admittedly one of the greatest causes of accidents. The police department attempts to regulate traffic and enforce careful driving. The official traffic force, however, is of such small size that it can correct only the most flagrant violations of the traffic ordinance. Because of the limited funds appropriated for nearly every police department, as well as the inadequate personnel of the traffic force, an effective campaign in the education of the driving public can not be easily conducted by the city officially. Education in careful driving and on the need for complying with the traffic ordinance must be undertaken by some private organization coöperating with the police authorities.

The Minneapolis Civic and Commerce Association has for some years past conducted educational work with respect to careful driving and the prevention of accidents. Until two years ago the plan adopted was to give wide publicity to the fact that the Association desired to have reported to it all instances of careless driving in which the traffic ordinance had been violated. The citizens of Minneapolis, after being encouraged to report such cases, did so in great numbers. The license number of the car reported was looked up, and a courteous letter was sent to the offender, calling attention to his offense and appealing to his public spirit to be more careful in the future. For the second or third offense the individual was called into court, and if the offense was serious enough he was usually fined.

After trying out this system for two years, the Committee on Accident Prevention reached the conclusion that it was not preventing a sufficient number of accidents caused by careless driving and, further, that a polite note sent to a violator, calling his attention to the fact that because of his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careless driving he had nearly killed Mr. John Smith, was both bad form and poor judgment. The committee therefore decided that some new plan must be adopted whereby Mr. Violator could be called upon the carpet and sufficiently penalized—so much so that he would hesitate to continue his careless practice of endangering the lives of his fellow citizens.

Realizing the necessity of such a plan, the committee offered to organize for the Police Department a force of men that could be commissioned special traffic officers and actually make arrests and take flagrant violators into court. The Police Department agreed to assign a lieutenant as the director of this force, and to give him the necessary clerical assistance. A special room was provided where violators could be interviewed. The Committee on Accident Prevention then set about to obtain the services of men interested in traffic work to be commissioned as police officers. After two months of work, the committee selected sixty-four men who agreed to be appointed as special traffic officers under the following pledge:

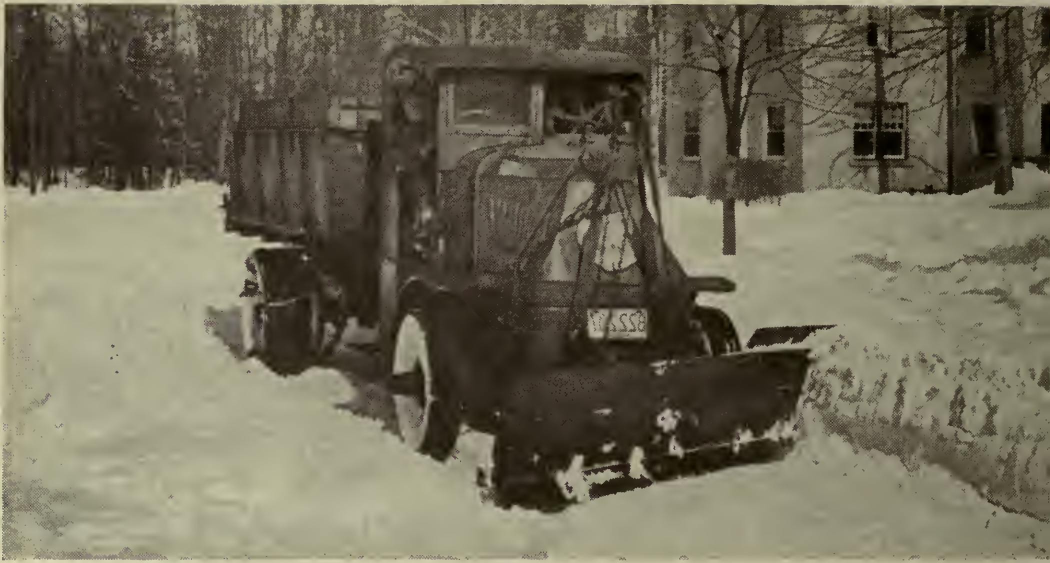
ARE YOU TROUBLED WITH THE "SUICIDE CUT" IN YOUR CITY?

> "I hereby apply for appointment as a special traffic officer, with the understanding that the duties involved will be to meet the regular monthly assignments for evening work and all emergency calls emanating from the headquarters of the Police Department.
>
> "In addition to this special work, I understand that the duties of a special traffic officer are conscientiously to correct violations of the traffic ordinance as I see them committed daily on the streets of Minneapolis."

Some of the members of the Association's Committee on Accident Prevention and other business men who had had previous experience in traffic work and who thoroughly understood both the city ordinance and the state law in regard to traffic were selected by the Chief of Police as the eight squad leaders in this organization. Before the commissions were actually given to the men, several meetings were held at which municipal judges and police officers explained what the duties of the leaders would be, and instructed them in all phases of traffic work. After this course of instruction was over, badges and commissions were given to the men and each was assigned to a certain squad and instructed to do no individual work until he had had experience under competent direction. During the first meetings of these squads more attention was given to the instruction of the members than to the correction of violations, and this plan was pursued until all the members were thoroughly acquainted with their duties. With the organization details and the instruction finished, the campaign of educating the driving public was commenced.

TURNING IN THE MIDDLE OF THE BLOCK. IT IS AGAINST THE LAW AND A PUBLIC NUISANCE

The method of actually making an arrest is important. The tags provided by the Police Department are in two parts. One half is retained by the officer making the arrest, and the other, with a string attached to it, is tied onto the machine or handed to the driver. The tag retained by the officer gives the license number of the car, the name and address of the driver, the section of the traffic ordinance violated and the date, time, place and number of the officer making the arrest. On the other side is ample space for detailed remarks. The stub given to the offender gives the license number and date, and states: "You have violated the traffic ordinance, Section No. ....," with the number of the officer making the arrest. On the other side the stub reads: "Please report to Room 25, City



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Labor is scarce and expensive. Hand removal is difficult at best and often impossible. The simple solution is an ample equipment of Champion snow plows which will keep your roads and streets open during and after the heaviest snowfall.

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"Everything for the Roadmaker"

Hall, at 9 A. M. You are released through courtesy, and failure to report as directed makes you liable to arrest," and is signed by the Superintendent of Police.

After the organization work was under way, the Secretary of the Civic Division began the publication of a monthly bulletin to traffic officers, in which the officers were kept informed on everything that was happening in the traffic field, and containing a report of the number of arrests and the work of the individuals and of squads. In this bulletin also each squad was assigned two definite dates on which it was to work during the month. The administration of the special police officers was in direct charge of the Police Department, but an executive committee composed of the eight squad leaders of the special traffic officers, the lieutenant in charge of this division of the Police Department, a representative from the Minneapolis Automobile Club and of the Minneapolis Civic and Commerce Association, and a secretary furnished by the Association, served in an advisory capacity to the Superintendent of Police.

The special night work of the organization has not been the most important feature. The committee in charge of the special officers feels that the most effective work has been accomplished at times when the officers were not on special duty, by their conscientiously correcting traffic violations as they saw them committed while going about the city upon their daily business. On two occasions during last summer the entire force was called out, once making 600 arrests and the other time approximately 500. A few jolts of the driving public against a force armed with authority has established a realization of the fact that the city streets do not belong to individual drivers. It is no longer a common thing to see a Ford without a tail light, or to see the best-paved streets of the city made into speedways, nor is it common to see automobiles pass open gates of streets cars. Other similar violations are continuously checked. If a fire occurred in a theater, the people could emerge from the exits without having the street blocked by automobiles parked there. And the drivers of cars have ceased to leave them standing in front of fire hydrants.

The less important details of the city traffic ordinance have also been impressed upon the minds of the drivers, not because they have suddenly become interested in the traffic ordinance on account of its being entertaining reading, but because a good percentage of the driving public have at some time or other during the last year been arrested, taken to the police station, given a copy of the traffic ordinance, and told that if they come again they will be sent to court.

But all offenders do not get off so easily. Since active operations began on the first of June, 1919, 25,201 offenders have paid a visit to the police headquarters. Of this number, 3,365 have been sent to court, convicted and fined. These have been the most flagrant cases of carelessness, and the penalties have ranged from a one-dollar fine to ninety days in the workhouse.

The only basis of comparison in figures of this kind is to take as examples similar months in two different years. As the work has been in progress at the time of writing only fourteen months, the only two months that can be compared are June and July of 1919, and June and July of 1920. Under practically the same traffic conditions, with the exception of an increase of 47 per cent in the number of automobiles in use, it is found that serious violations of the traffic ordinances were decreased in June, 1920, by 88 per cent, or from 376 to 176; and in July, 1920, by 42 per cent, or from 261 to 183. The figures are the number of serious cases that were taken into court and received fines or workhouse sentences.

It might be surmised that the decrease in the number of serious offenses is caused by a lack of vigilance on the part of the Special Officers. This, however, is not true, as the number of arrests made in June and July, 1919, totaled 2,045, while the number of arrests in June and July, 1920, totaled 3,941.

It is a little difficult to visualize a picture from these figures, but briefly it is this: with nearly twice the number of automobiles running the streets of Minneapolis in 1920, and the Special Traffic Officers checking up every violation with which they came in contact, 1,896 more people were arrested in 1920, than in 1919, but the number of court offenses decreased very materially. Thus these figures tell their own story, and to add a touch of human interest, this article is glad to record that while there were two

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fatal automobile accidents in June, 1919, there was only one in June, 1920; and while there were three in July, 1919, there were but two during the same month in 1920. The record of minor and serious automobile accidents would be in the same proportion, but definite figures have not yet been compiled.

This story shows very clearly that the "Specials" have been continuously pressing the lever harder in the stricter enforcement of the ordinance and that the driving public is becoming more careful and law-abiding. It is needless to say that the "Specials" as an organization are well known, and, with at least some of the people of the city, are none too popular. This fact does not bother them, however, and the organization has received the heartiest support from all the civic organizations, all the municipal departments, including the regular traffic force, and from the daily papers.

Simultaneously with the active work in the field, a publicity campaign has been conducted. A series of pictures has been run, illustrating the different ways in which the traffic ordinance is continuously being broken and the possible results in damage to property and loss of life. These two forces, working together, have brought the public consciousness to the point of understanding the necessity of accident prevention, which up to the inauguration of this work received almost no consideration. The constructive work that the special traffic officers have done for the city is beginning to make the public realize that the subject of accident prevention should be given as much attention as the community gives to the other factors of civic betterment. Many cities in America are beginning to realize that it is wiser to expend effort and money upon preventive measures than to expend a great deal of time and a larger sum of money in salvage work.

This is especially true of the safety movement. The Minneapolis Civic and Commerce Association feels that it must incorporate into the very foundation of the community life the thought that by employing preventive measures properly, life and property can be conserved. It realizes, of course, that the solution of the traffic problem is not the only means of reaching this end, but chambers of commerce and other civic bodies must appreciate the great need for urging the adoption of preventive measures in our industries, among our school children and in our homes. When this idea becomes a part of us, we shall cease to look upon "Safety First" as a subject to be discussed once in a while during the year, and we shall begin to realize that it is a component part of the civic consciousness of the community. The chamber of commerce can do much toward furthering the cause.

On the Calendar of Conventions

September 7-10.—Holyoke, Mass.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, Dedham, Mass.

September 9-11.—Louisville, Ky.
American Association of Park Superintendents. Annual convention. Secretary, Emmet P. Griffin, Superintendent of Parks, East St. Louis, Ill.

September 13-17.—San Francisco, Calif.
American Public Health Association. Annual meeting. Secretary, A. W. Hedrich, 169 Massachusetts Avenue, Boston, Mass.

September 20-23.—New Orleans, La.
Southwestern Water Works Association. Annual convention. Secretary, E. L. Fulkerson, 617 Washington Street, Waco, Tex.

September 21-22.—Detroit, Mich.
American Water Works Association, Central States Division. Annual convention. Secretary, R. P. Bricker, Shelby, Ohio.

September 27-28.—Harrisburg, Pa.
Pennsylvania State Chamber of Commerce. Annual meeting. Secretary, George E. Foss, Telegraph Building, Harrisburg, Pa.

September 27-October 1.—Milwaukee, Wis.
Annual Safety Congress. Secretary, S. J. Williams, 168 North Michigan Avenue, Chicago, Ill.

October 1-3.—Urbana, Ill.
Better Community Conference. Annual conference. Held under the auspices of the University of Illinois. R. E. Hieronymous, Community Adviser, Urbana, Ill.

October 6-8.—McPherson, Kans.
League of Kansas Municipalities. Annual convention. Secretary, Albert A. Long, University of Kansas, Lawrence, Kans.

October 10-15.—St. Louis, Mo.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, 404 Lincoln Avenue, Valparaiso, Ind.

October 13-14.—Boston, Mass.
Massachusetts Chamber of Commerce. Annual meeting. Secretary, Edward G. Stacy, 6 Beacon Street, Boston, Mass.

October 13-15.—Amherst, Mass.
American Civic Association. Annual convention. Secretary, E. E. Marshall, Union Trust Building, Washington, D. C.

October 14-19.—Columbus, Ohio.
American Prison Association. Annual congress. General Secretary, Joseph P. Byers, Frankfort, Ky.

October 19-22.—New Orleans, La.
International Association of Municipal Electricians. Annual convention. Secretary, Clarence R. George, Houston, Tex.

October 25-27.—Chicago, Ill.
National Association of Commercial Organization Secretaries. Annual convention. Secretary, F. D. E. Babcock, Chamber of Commerce, Worcester, Mass.

November 8-12.—Chico, Calif.
League of California Municipalities. Annual convention. Executive Secretary, W. J. Locke, Pacific Building, San Francisco, Calif.

November 15-17.—Cincinnati, Ohio.
City Managers' Association. Annual convention. Executive Secretary, Harrison G. Otis, 812 Tribune Building, New York City.

November 16-18.—Los Angeles, Calif.
Fire Marshals' Association of North America. Annual convention. Secretary, George H. Nettleton, St. Paul, Minn.

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The experience of others is always the best guide by which to buy motor trucks.

There is a veritable wealth of evidence that shows that municipalities have found full value in the Federa's they operate. The letter that follows from T. J. Hensley, Supt. of Streets and Public Improvements, is only typical:-

"In reply to your inquiry of recent date, beg to say that I have been using the Federal Five ton truck on the streets of Lincoln for the past eight months and have found it more than satisfactory in every particular There is mounted on it a 1200 gallon Flusher tank, and it handles it under all conditions with perfcet satisfaction. I am not boosting for any special truck, but we have pretty nearly all kinds of trucks in service in the City Departments, and in my opinion the Federal Truck is far superior to any truck we now have in service, and while I have no interest in any special make of truck, I would gladly recommend the Federal truck."

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The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Where Municipality Has But Easement Over Street or Alley Abutting Land, Owner May Prevent Removal of Tree or Structure Not Interfering with Public Use

A recent decision of the Minnesota Supreme Court has important bearing on municipal control over alleys and streets where, as seems to be almost universally true, the municipality does not own the land occupied by such ways in fee simple, having but an easement for the purposes of public travel. It is held in the case of Pederson vs. City of Rushford, 177 Northwestern Reporter, 943, that municipal authorities have no right to require the removal of trees or structures encroaching upon an alley where neither constitutes an interference with existing public use. Affirming judgment in plaintiff's favor for damages for removal of a wood shed and tree from an alley at the rear of plaintiff's lots, the Minnesota Supreme Court said:

"The abutting lot owner owns the fee to the center of a platted street or alley and his ownership includes trees growing therein. The public has but an easement and the abutting owner may use the land for a purpose compatible with the use by the public of its easement. . . . .

"The alley has never served a general public purpose. There has never been a definite route of travel through it. The tree was not an obstruction to public use. The woodshed was at a point where the alley was not capable of practical use for purposes of travel. The ground was steep and rough and immediately graded into a precipitous bluff up which traffic was impossible. There was no intention on the part of the authorities of the city, when the notice was given, to grade the alley nor to put it into condition for public travel.

"The case is fairly within the principle of West vs. Village of White Bear, 107 Minn. 237, 119 N. W. 1064, where the destruction of trees within the limits of a street was enjoined, and other cases cited above. The tree was not an obstruction to public travel nor was it taken for a public use. The use made by the plaintiff of the alley for his woodshed was compatible with any actual or contemplated use by the public."

Under Legislative Authority Municipalities May Require Certain Commercial Vehicles to be Licensed

The Legislature can authorize municipal authorities to require that a license be obtained for all vehicles engaged in carting for hire, whether under special contracts, or where the employment is publicly solicited. (New York Supreme Court, Appellate Division; W. N. Stevenson, vs. Hartman, 181 New York Supplement, 465.)

Extent of Liability of Municipality for Failure to Light Streets

"The lighting of streets is a discretionary or governmental function, and a city is not liable for failure to light them, even though it may own its own plant for that purpose, unless such lighting is necessary to warn travelers of some defect or obstruction in the street, or unless its charter or some general act of the Legislature imposes on it the duty to light them. The mere power given it by charter to light its streets does not render a city liable for failure to exercise such power. The duty to do so must be expressly created by statute to create liability." (West Virginia Supreme Court of Appeals, Holsberry vs. City of Elkins, 103 Southeastern Reporter, 271.)

A Contract, Although Invalid by Reason of Authorization by Less than Required Number of Councilmen, May be Ratified by Council Acting as a Body

A provision of a city charter that, "every ordinance, order or resolution, appropriating money, creating any liability of

Make Streets Clean

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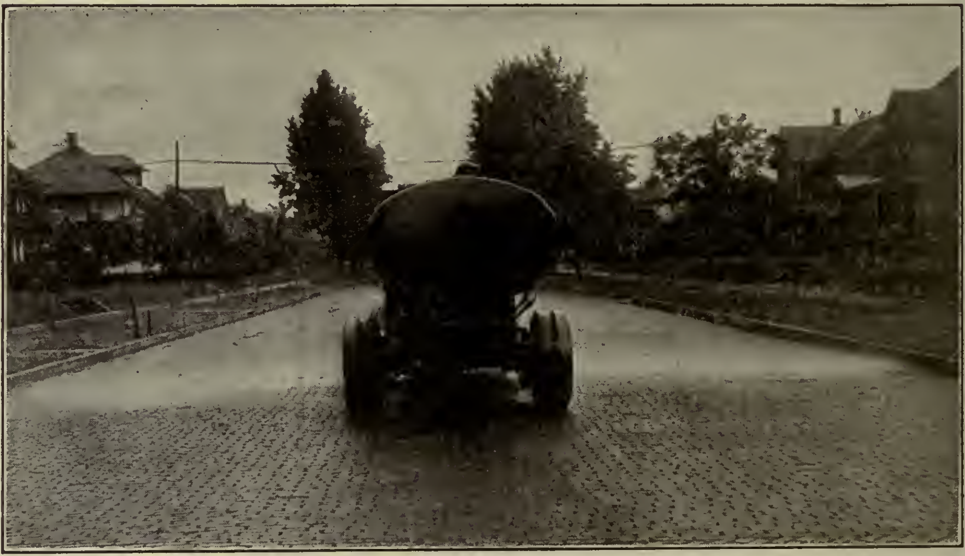
FLUSHING and SPRINKLING UNITS



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A horse-drawn uniform pressure flusher is provided where conditions do not justify investment in a motor flusher but where economical, efficient and sanitary cleaning is desired.

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Municipal Supply Company

South Bend, Indiana

the city, awarding or approving of any contract for the payment of money, shall require a four-fifths vote of all the members of the city council," applies to a contract creating an obligation on the part of the city to furnish steam for power. Such a contract authorized by three of five councilmen is of no effect. Such a contract, being one which the city had power to make, may be subsequently ratified. Ratification can only be by the city council acting as a body. It may be effected by any action or contract which gives to the contract the stamp of approval and this may be done by acquiescence with knowledge of the facts. (Minnesota Supreme Court, Tracy Cement Tile Company vs. City of Tracy, 176 Northwestern Reporter, 189.)

Issue of Municipal Bonds Not Invalidated by Misnomer

That municipal bonds may have been inaptly designated as "Park and Boulevard Bonds" will not invalidate their issue for the authorized purpose of providing funds for the establishment and extension of a recreation system, holds the Michigan Supreme Court in the case of Common Council of City of Detroit vs. Engel, 173 Northwestern Reporter, 547.

Where City Has Obtained Benefit Under Defective Contract Allowance of Claim by Council Will Not Be Set Aside

Where a city has the power to enter into a contract, but the manner of the exercise of the power is irregular or defective, and the city purchases, uses, and still retains property purchased under such irregular proceedings, no element of fraud or lack of consideration being shown, the allowance of the claim by the city council will not be set aside at the suit of a taxpayer. (Nebraska Supreme Court, W. L. Stickel Lumber Company vs. City of Kearney; 173 Northwestern Reporter, 595.)

Where City's Bonds Are Invalid, City Not Liable to Other Than Original Purchaser

A subsequent purchaser of bonds of a municipality, which were void because issued under an invalid statute, cannot recover from the city, even though the original purchaser from the city, who made a payment into the treasury, might recover the amount thereof, for to support an action for money had and received there must be some privity existing between the parties in relation to the money sought to be recovered. (Kentucky Court of Appeals, City of Henderson vs. Winstead; 215 Southwestern Reporter, 527.)

Rebuttable Presumption of Validity of City Ordinances Contained in Compilation

Ordinances contained in the compilation of a city's ordinances are presumed to have been regularly adopted and to be in effect, although the signature and authentication of the several ordinances do not appear. But defects in ordinances in their enactment for failure to comply with statutory provisions are not cured by their inclusion in a compilation. (Iowa Supreme Court, Barrett vs. Chicago, Milwaukee & St. Paul Railway Co., 175 Northwestern Reporter, 950.)

Under Constitutional Provision for Removal of Appointed Officers, Official Elected by Mayor and Council Held Appointed

The clause of the Pennsylvania Constitution which provides that appointed officers other than judges and the superintendent of public instruction may be removed at the pleasure of the power by which they shall have been "appointed" is held by the Pennsylvania Supreme Court in the case of Commonwealth vs. Likely, 110 Atlantic Reporter, 167, to authorize removal of a city clerk, chosen under a statute providing for his "election" by the Mayor and Council. The word "election" in such a statute is regarded as a substitute for "appoint"; the term "elect" properly signifying selection by popular will.

Not Unlawful Discrimination for City to Fix Water Rates by Reasonable Classification of Consumers

Proper classification of patrons by a water corporation, municipal or otherwise, is permitted, and the city of Erie, and the commissioners of water-works in such city did not unlawfully discriminate in requiring users beyond city limits to pay 25 per cent over city rates and actual cost of extension of the service into their respective proper-

A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

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ties. (Pennsylvania Supreme Court, Youngman vs. Commissioners of Waterworks, 110 Atlantic Reporter, 174.)

In Voting Under Recall Statute Incumbent Cannot Be Removed Unless Successor is Voted For

A city officer is not removed from office by a vote of a majority of the voters for his recall, where no votes are cast for a successor, there being no vacancy in office unless a successor is voted for and fails to qualify, under the California recall statutes. In reaching this conclusion in the case of Cohn vs. Isensee, 188 Pacific Reporter, 279, the California District Court of Appeal said:

> "The purpose of the recall statute is to enable a majority of the voters, voting at any recall election, to remove an unfaithful or undesirable incumbent of any elective office of the city or town. But if, as in the instant case, no nominating petition has been filed nominating a candidate for the office, and if, therefore, no name of such nominee be printed on the ballot, then, even though a majority of the voters vote 'Yes' on the question of the incumbent's recall, their purpose must be frustrated if they are not to be permitted to write in the name of any person as their choice for the office."

City Ordinance Requiring Milk Offered for Sale to Be Pasteurized Upheld

The ordinance of Milwaukee requiring milk sold in the city, except certified milk and tested milk, to be pasteurized by the holding or the flash system is a regulation for the protection of the public health, within the discretionary power of the council, according to the decision of the Wisconsin Supreme Court in the case of Pfeffer vs. City of Milwaukee, 177 Northwestern Reporter, 850.

Unauthorized Consent to Placing of Electric Wires in Public Ways

"When consent to use a city's public ways can be obtained only from its own legislative assembly, and in a particular mode (in this case by an ordinance), the administrative officers cannot waive the necessity of procuring consent from the assembly, and in the prescribed mode. Neither can they, by acquiescing in the use of a public way by a utility corporation, estop the city to terminate the use." (Missouri Supreme Court, Holland Realty & Power Company vs. City of St. Louis, 221 Southwestern Reporter, 51.)

City's Duty to Abutting Owners in Constructing Tunnels in Streets

Where a city undertakes to construct a tunnel in a street the fee of which is in the abutting owners, it must use ordinary skill and care to sustain the land of the abutting owners. (Porter vs. City of Los Angeles, 189 Pacific Reporter, 105.)

City's Title to Public Way Not Divested by Non-User

That the rights of Missouri municipalities in lands dedicated to use as alleys are not lost by mere non-user and that such lands are not governed by the low of adverse possession which applies to private ownership of land, is shown by the decision of the Supreme Court of the State in the case of Marshall vs. City of Springfield (221 Southwestern Reporter, 17). Plaintiff unsuccessfully attempted to quiet title to a strip of land which had been dedicated for use as a public alley, on the ground that defendant city had abandoned or was estopped to assert any rights to the strip. Deciding the case in favor of the city the Missouri Supreme Court says:

> "Appellant's claims of abandonment and equitable estoppel are predicated on the same facts, viz., the non-use of the strip of ground as an alley, the failure of the city authorities to open, grade, or otherwise improve it, and their action, not only in permitting appellant to occupy and use it in a way inconsistent with its use as an alley, but in assessing it in her name and collecting from her taxes thereon. The questions thus presented are not new, but have been heretofore fully considered and passed on adversely to appellant's contentions. The rule obtains in this state that a city has no power to part with the title to its streets which it holds in trust for the public except by a valid vacation. The designation of the public way in question as an alley does not withdraw it from the influence of the rule. It was given and accepted as a public alley. It is therefore a highway, and not a private way. The right of the public to use the way, and not the size of the way or the number of persons who may choose to exercise the right, determines its character.
>
> "The principle of equitable estoppel has been applied by this court, in exceptional cases, to municipal corporations in matters pertaining to their governmental functions, but the facts of this case do not bring it within the doctrine announced in those."

Concrete Lighting Standards

Elegance, Permanence, Utility Combined

1. **THE BOULEVARD** — Height 13′-0″. For Parks, Drives and Boulevards.
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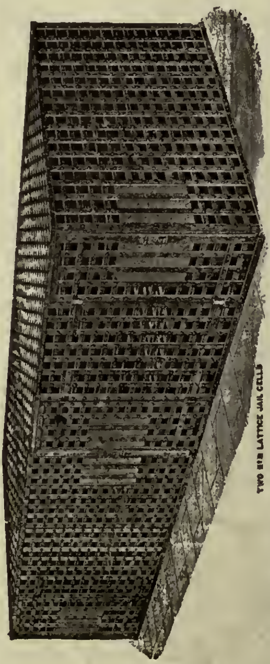
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Jail Entrance Doors, Jail Bedsteads. Window Guards.
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Municipal and Civic Publications

SOCIAL THEORY.

G. D. H. Cole, Fellow of Magdalen College, Oxford. Frederick A. Stokes Company, New York. 1920. 220 pp with bibliography.

An analysis of social theories by the author of "Self-Government in Industry," "Labour in the Commonwealth," and other works. It aims to describe the state based upon a functional organization of society, such as that conceived by the proponents of Guild Socialism. While picturing a society grouped somewhat along the lines of a system of soviets, the author proposes a state with powers strictly limited to the fundamental political purposes of government.

PROCEEDINGS OF THE ELEVENTH NATIONAL CONFERENCE ON CITY PLANNING.

The University Press, Cambridge, Mass. 1920. 207 pp.

This volume contains the addresses presented at the Conference held at Niagara Falls and Buffalo, May 26-28, 1919. It includes papers on such topics as planning industrial subdivisions, planning problems of industrial cities, civic centers, and residential zoning. A very considerable part of the volume is devoted to various phases of regional planning, with papers presenting the subject both in general and in detail. This book not only describes a number of important recent projects in city planning, but discusses theoretically the principles that govern city and regional planning in the present and near future.

COMMERCIAL RECREATION

The Cleveland Foundation Committee, Cleveland, Ohio. 1920. 155 pp. Maps and illustrations.

This report on commercial recreation is one of the seven sections of the report of the Recreation Survey of Cleveland conducted under the auspices of the Cleveland Foundation A complete list is given in the back of the volume. The survey covers all the forms of commercial amusement found in Cleveland, including motion pictures, billiard rooms, dance halls, amusement parks, and other kinds of popular entertainment. The report comprises a brief summary of general conclusions and a digest of city ordinances on commercial amusements.

PUBLIC PROVISION FOR RECREATION.

The Cleveland Foundation Committee, Cleveland, Ohio. 1920. 198 pp. Maps and illustrations.

This report on public provision for recreation is one of the seven sections of the report of the Recreation Survey conducted under the auspices of the Cleveland Foundation. It covers in detail the subjects of playgrounds, school gardens, school community centers, municipal bath houses, public parks, and the Public Library. The volume concludes with a brief summary of conditions with recommendations

TECHNICAL WRITING.

By T. A. Rickard, Editor of the "Mining and Scientific Press," San Francisco; special lecturer at Harvard, Columbia, McGill, Stanford and California. First Edition. John Wiley & Sons, Inc., New York. 1920. iv + 178 pp.

THE LUNCH HOUR AT SCHOOL.

Katherine A. Fisher. Prepared for the Bureau of Education by the Child Health Organization of America. Published by the Bureau of Education, Department of the Interior, Washington. 1920. 61 pp. Illustrated. (Apply to the Bureau of Education.)

WOMEN AND HOUSING.

Report of a Conference of Women's Organizations, held at the "Daily Mail" Ideal Home Exhibition, Olympia, London. The Garden Cities and Town Planning Association, London, W.C. 1. 1920. 23 pp. (Apply to the Secretary, 3 Gray's Inn Place, Gray's Inn, London, W.C 1.)

REPORT ON STREET LIGHTING COSTS IN THE LARGER CITIES OF THE UNITED STATES.

Prepared by F. W. Ballard & Co., Cleveland, Ohio. Figures corrected to July 1, 1920.

REPORT OF THE FIRE MARSHAL OF NORTH DAKOTA.

Sixth Annual Report. For year ending June 30, 1919. H. L Reade, Fire Marshal. 9 pp.

REPORT OF THE COMMITTEE ON LEGISLATION OF THE CITIZENS' UNION.

Sixteenth annual report, covering the regular session of 1920 of the New York State Legislature. The Citizens' Union, New York City. 95 pp. (Apply to Walter Tallmadge Arndt, Secretary, 41 Park Row, New York City.)

PROCEEDINGS OF PUBLIC OWNERSHIP CONFERENCE.

Held in Chicago, November 15-17, 1919. Public Ownership League of America. 1919. 290 pp (Apply to Albert M. Todd, Kalamazoo, Mich.)

STATISTICAL ABSTRACT OF THE UNITED STATES.

Forty-Second Number, 1919. Bureau of Foreign and Domestic Commerce, Department of Commerce. Washington, D. C. 1920. 864 pp. Index.

SANITARY PRIVIES.

"Plans and Working Directions for Inexpensive Sanitary Privies, with Notes on the Protection of Surface Wells." Circular issued by the Illinois State Department of Health, Division of Sanitation. 31 pp Illustrated.

THE NINTH ANNUAL REPORT OF THE STATE FIRE MARSHAL OF IOWA FOR THE YEAR 1919.

J. A. Tracy, State Fire Marshal. 43 pp. Published by the state of Iowa. 1920.

Municipal Reports

Akron, Ohio.—Rules and Regulations Governing the Platting of Land Adopted June, 15, 1920, by the City Planning Commission. (Apply to H. S. Firestone, President.)

Fall River, Mass—Annual Report of the Board of Health for the year ending December 31, 1919. (Apply to Samuel Sandler, M. D., Chairman.)

Fitchburg, Mass.—Annual Report of the Park Commissioners of Fitchburg, Mass., for 1919. (Apply to D. Sidney Woodworth, Chairman.)

Ft. Wayne, Ind.—Thirteenth Annual Report of the Board of Park Commissioners. 1919. (Apply to David N. Foster, President.)

Holland, Mich.—Annual Report of the Board of Public Works of the City of Holland, Mich., for the fiscal year ending March 15, 1920. (Apply to Walter Lane, President.)

London, Eng.—Thirteenth Research Report of the Metropolitan Water Board of the city of London, Eng. (Apply to Sir Alexander C. Houston, Director of Water Examination, Metropolitan Water Board.)

Milwaukee, Wis.—Zoning for Milwaukee. Tentative Report of the Board of Public Land Commissioners to the Milwaukee Common Council, June 21, 1920. (Apply to C. B Whitnall, Chairman.)

New Orleans, La.—Report of the Health and Sanitary Survey, conducted jointly by the Board of Health for the Parish of Orleans and the City of New Orleans and the Metropolitan Life Insurance Company of New York. 1918-1919. (Apply to William H. Robin, M. D., Superintendent of Public Health, City of New Orleans.)

Philadelphia, Pa.—Annual Report of the Bureau of Highways, Department of Public Works, for the year ending December 31, 1919. (Apply to Fred C. Dunlap, Chief of Bureau.)

Trenton, N. J.—Annual Report of the Comptroller of Trenton, N J., for the year ending December 31, 1919; revenues and expenditures. (Apply to Edward W. Lee, Director of Revenue and Finance, and Comptroller.)

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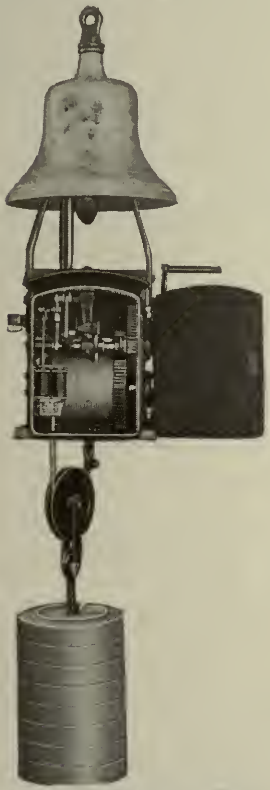
Builders of Water Service devices since 1853

Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Simple Automatic Bell-Striker for Small-Town Fire Alarms

There are many small towns throughout the country which for years have put up with makeshift signals because of the expense of many of the better type of bell signals. The Gamewell Fire Alarm Telegraph Company, Newton Upper Falls, Mass., manufactures a unit type bell striker which is developed especially for towns of the type mentioned above.



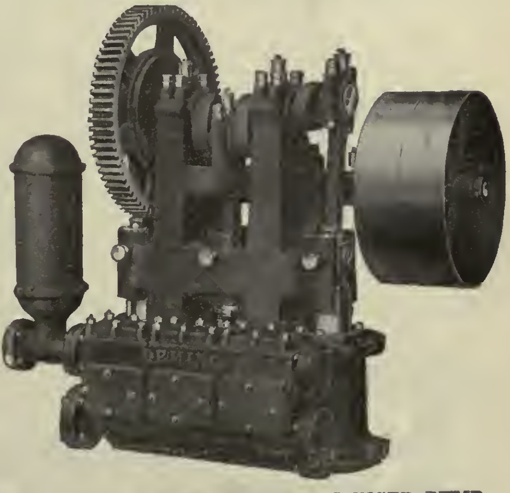
AN AUTOMATIC BELL-STRIKER THAT SERVES SMALL COMMUNITIES

In small towns which have no fire alarm system, the striker is mounted on the top of a building telegraph pole, or anywhere that gives sufficient height for good sound effect. The mechanism by which the alarm is sounded can be located in the fire chief's house, telephone exchange, railroad station, or any central point where fires will be reported. The mechanism or transmitter is mounted on slate with a space for twenty number wheels. When an alarm comes in, the person on hand simply selects the proper number wheel, places it on the wheel holder, pulls the lever, and the entire town is notified. The alarm can be sounded at the maximum speed of one blow a second, which gives prompt action before the fire has developed too far. One, two, three or four rounds of the alarm may be sounded, as desired. The transmitter is mounted on slate with holes in each of the four corners so that it may be readily put up. It requires a space of about 18 by 22 inches and needs no attention except an occasional oiling.

One of the special features of the bell striker illustrated herewith is the ease with which it can be installed. The bell, the operating mechanism and the weights are all in one unit. The striker can be hung and the transmitter mounted in from three to four hours. Probably the easiest method of installing the bell striker is to place it on skids overhanging a flat roof with the weights suspended along the outside of the building, and the housing mounted with the door facing the building so that it will be readily accessible for winding and inspection. The only attention necessary for the striker is that it be wound occasionally. When fully wound, it has a capacity of 3,600 blows, which is ample for a great many alarms. All of the operating mechanism is in the cast iron housing. This housing is provided with a rubber gasket against which the door closes. The handle with the screw clamping latch forces the door tight against the gasket, making the box absolutely water-proof. The outside of the box is painted to effectivelv protect it against the weather.

Triplex Plunger Pumps for Small Water-Works

The modern pumps for small water-works may be generally divided into two types, reciprocating or centrifugal. The name "reciprocating pump" covers all pumps in which



A SINGLE ACTING TRIPLEX PLUNGER PUMP WITH PULLEY FOR BELT DRIVE

Are You Among The 400?

About 400 American towns have equipped all their fire-fighting apparatus with Firestone Tires.

They have done this for the better protection of their homes and their business property.

They have proved to their own satistaction that Firestone equips the Department for speedier, more reliable service, reduces accidents and adds materially to the life of the apparatus.

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Miles
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Is Your Town One Of The 400?

The following manufacturers of fire apparatus use Firestone equipment:

Ahrens-Fox Fire Engine Co.
Cincinnati, Ohio
American & British Mfg. Co.
Providence, R. I.
International Motors Co.
New York, N. Y.

American-LaFrance Fire Engine Co.
Elmira, N. Y.
Robinson Fire Apparatus, St. Louis, Mo.
The Seagrave Co., Columbus, Ohio.
Stutz Engineering Co.
Indianapolis, Ind.

FIRESTONE TIRE & RUBBER COMPANY
Firestone Park Akron, Ohio
Branches and Dealers Everywhere

Firestone

the water is displaced by a plunger, piston or bucket, working back and forth in the cylinder. Reciprocating pumps are generally classified (1) with regard to the plane in which the plunger or pistons move (vertical or horizontal); (2) in regard to the number of displacements (single-acting or double-acting); (3) in regard to the number of cylinders; (4) in regard to the manner of packing; (5) in regard to the form or kind of displacers (plungers or pistons).

Probably one of the most common types of reciprocating pumps used in small waterworks is the vertical, single-acting, simplex plunger pump. The Deming Company, Salem, Ohio, has developed this pump in a large number of sizes, which may be belt-driven or motor-driven by means of an intermediate pump gear, and rawhide or fibre motor pinion. The frame consists of two standards and includes cross-head guides and main crank shaft bearings, the latter being lined with anti-friction metal. The gearing is machine-cut and is double in most of the sizes. The pinion shaft is steel, running in boxes lined with anti-friction metal and bolted to the main housing, and the connecting rods in the 4 x 6 size and larger have bronze boxes with wedge and screw adjustment at the cross-head end, with marine type babbited boxes at crank end. Smaller sizes have bronze bushings at the cross-head end. The cross-heads run in bored guides. The plungers are of hard grained cast iron, finished true and smooth, and reciprocate through packing of ample depth. In sizes 10 x 10 and smaller, the cylinders and base are in one casting, while for the larger sizes three separate castings are used bolted to the base. The valve chambers in the larger sizes are separate castings, bolted to the cylinder. These have liberal proportions, affording large valve area, and all valves are readily accessible. Valves for cold water are rubber discs, protected on top from cylindrically wound springs by brass plates. The valve seats are of bronze, screwed into decks, and are of the grid type.

Landscape Architects Dissolve Partnership

In June of this year the partnership of the well-known firm of landscape architects, Arnold & Tripp, Guardian Building, Cleveland, Ohio, was dissolved, Sheffield A. Arnold continuing his business in Boston, and B. Ashburton Tripp taking over the work of the Cleveland office.

Mr. Tripp, who was a graduate of the Harvard School of Landscape Architecture, Cambridge, Mass., was formerly with Olmstead Brothers, Brookline, Mass., and practiced in Detroit, Mich., in 1912. In 1915-16 he was landscape architect and town planner to the Panama Canal and was responsible for the well-known artistic planning and planting of the towns, parks, playgrounds and fortification garrison communities. He specializes in institution group plans, village and town plans and extensions, and park, playground and estate design.

A New Method of Installing Meters

A new device which is being used in many of the houses now building provides for electric meters in a very advantageous way. Under the new arrangement, meters are set in the exterior wall of the house, facing outward; when the meter is to be read by the public service company's employe, he has no occasion to come inside the house or make his presence known in any way; he reads the meter from the outside, and goes his way.

The time-saving, trouble-saving features of this method are instantly apparent, and are not counter-balanced by disadvantages of any sort. The cost is low—$12.50 for each meter so housed if boxes are built in when the house is erected.

CONVENIENCE IN METER READING

The meter boxes do away with many objectionable conditions; save basement-space the meters would occupy and protect the meters against accident that might have troublesome results. The manufacturers (Donley Brothers, Cleveland) say that these advantages impress householders so strongly that installations are often made in houses already built—the owners being willing to incur extra trouble and some labor-expense in order to do away with the nuisance which accompanies meters placed in the basement.

Chicago Office of Engineers

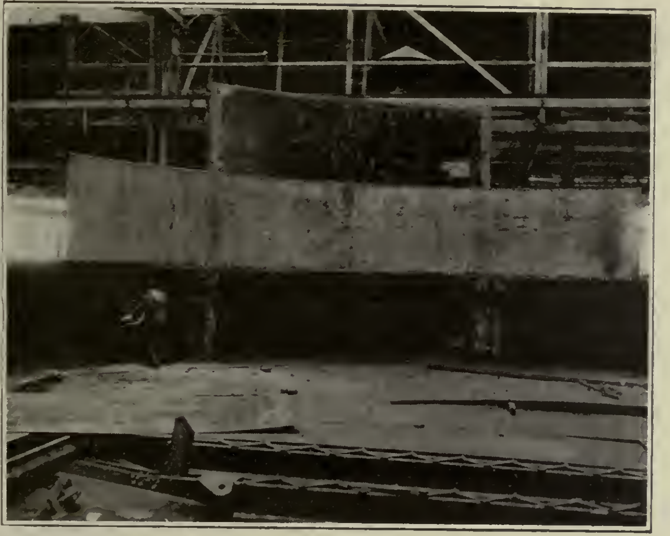
The Shourds-Stoner Co., Consulting Engineers and Architects, announce the opening of a Chicago office at 825 Harris Trust Building. This is in addition to their office at Terre Haute, Ind., and was found necessary because of the large amount of business secured by this firm throughout the central states.

Some truck owners equip their trucks with Kelly Caterpillars because Caterpillars enable them to operate the trucks without chains.

Others put them on because they cushion the truck.

For whichever reason they are bought, the owner gets not only the particular feature or features that appealed to him, but mileage such as he cannot get from any other type of tire, pneumatic or solid.

Kelly-Springfield Tire Co.
General Sales Department
1710 Broadway, New York



SHOP ERECTION OF STEEL TANK INSURES FIT WHEN ERECTED ON THE JOB

Huge Steel Tank for Great Falls, Mont.

Appreciating the need for increasing the storage capacity for the water-supply of Great Falls, Mont., the city has ordered a 1,000,000-gallon tank from the Chicago Bridge & Iron Works, Chicago, Ill. This tank is now being fabricated and when completed will be 54 feet in diameter and 60 feet high. The tank will be erected on a natural elevation in the city of Great Falls, Mont., and will constitute the main storage supply for the city.

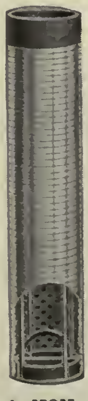
Following the usual custom of the Chicago Bridge & Iron Works on jobs of this character, the bottom and lower rings of the tank are now being assembled in the shop in order that they may be sure that the places will fit evenly and smoothly when put together by the erection crews in the field.

The Need of Well Screens

Whether or not a screen is needed in a well is determined by the stratum from which the supply is drawn and the quantity required. If the water-bearing material is of loose texture like glacial drift, soft sandstone or shale, having fine particles which can be carried, and the current of water leading to the well is strong enough to do it, conditions are produced which will clog the well or make it pump sand. The ability of the current to carry the loose material lies in its velocity and the remedy is found in slowing this down to a point where it no longer carries the material.

This process, called "well developing," consists in bringing the stratum about the well to a stable condition in which it offers free passage to the water which does not carry loose material. To bring this about it is often necessary to pump through a large part of the finer grains in order to surround the well with a body of coarse sand. This is done by pumping the well to a rate beyond its service capacity, by surging the water back and forth and keeping it up until the water pumps clear under service conditions. Wells in sand with a large percentage of fine particles and sands mixed with clay are specially in need of careful attention during development.

The proper place to stop sand entering a pump is to prevent the sand entering the well. There are a number of types of well ends. There are (1) the open pipe, which is the simplest kind of well end. This is adapted to small capacity wells in coarse gravel. The limit of the intake is the cross sectional area of the pipe minus the amount closed by the pebbles; (2) perforated pipe may be used in gravel that is coarse enough to leave free water way and too coarse to pull through the holes; (3) perforated points, covered with woven mesh, are in most common use to keep sand back. Their difficulties come from the nature of the inlet, which presents openings tending to wedge the material. Often the chemical content of the water is such as to set up destructive corrosion between the point and its jacket, completely closing it. These faults make it ill-adapted for use in a good well; (4) the Johnson Brass Well Screen, illustrated herewith and manufactured by E. E. Johnson, 2304 Long Avenue. St. Paul, Minn., is designed to overcome the objectionable features of other screens. The exclusive features of this screen include a continuous slot which increases the inlet area by about 50 per cent more than can be had in screens having interrupted slots. The value of this added area is that it increases the capacity of the screen, or a slower intake flow may be had with the same capacity. The screen is so formed that it will not clog, because of the special under-cut lip construction. If a sand grain can pass the outer edge it is clear to pass all the way through. No other form of solid brass screen permits this. The Johnson screen is designed to withstand the cutting action of the sand. To resist this cutting action, the screen is finished with a sharp under-cut edge of the slot, of very hard brass.



A NON-CLOGGING SCREEN WELL

Read how the manager of THE HOWARD REFRACTORIES COMPANY, Dorsey, Maryland, saved contracts by keeping his firm's busy trucks eternally on the job.

REPORTS from big truck users in the building industry confirm the effectiveness of 'NOBBY CORD' TIRES.

One firm, The Howard Refractories Company Dorsey, Maryland, says: "But for 'NOBBY CORD' PNEUMATIC TIRES, our trucks would have been useless last winter, as solid truck tire equipment invariably stuck in the mud before reaching our plant. 'NOBBIES' won the day and saved our contracts."

Less operating costs—increased speed—more mileage—reduction in mechanical repairs and vibrations, and greater traction, prove that—

'Nobby Cords' Save in Every Phase of Truck Operation

UNITED STATES RUBBER COMPANY
US
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

ONLY THE EXPERT KNOWS

how extremely easy it is to spoil in the making what otherwise would be a wonderful road. You may have the right specifications, the proper material and the best machinery available, but carelessness or poor judgment in the mixing or combining the material, in the spreading or in the compressing or rolling may lay the foundation for unlimited trouble.

Warren Brothers Company insist on the pavement being not only up to specifications, but that the product shall be mixed right and laid right. When you buy Warrenite-Bitulithic you not only buy the accumulated results of years of study and effort, but you obtain the services of one of our best engineers who sees that the road is right. In every department of the work you and the taxpayers who are spending the money are guaranteed the results you pay for.

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Warrenite-Bitulithic Pavement, Beacon Street (North Drive). Laid over old Macadam, 1914.

WARRENITE - BITULITHIC

has built up its enviable reputation as a result of this policy. Its makers, having provided the best possible specifications and materials for your particular needs, cannot then permit a mechanical error to jeopardize the good name of their product.

This supervision is a protection to you and to us and is your assurance of low maintenance cost and of ultimate satisfaction.

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Minneapolis, Minn.
San Francisco, Cal.
Winnipeg, Man.
Richmond, Va.
Nashville, Tenn.
Los Angeles, Cal.

A Convincing Endurance Test

In making recording instruments that are to be subjected to rough usage, the manufacturer has a double task before him. Accuracy is the first and indispensable desideratum, but it must be accompanied by a sturdiness of construction that will defy time, neglect, rough handling and over-work. This is especially true of water meters, that are frequently in charge of inexpert workers, that are set in all sorts of exposed places and that are subject, throughout the years, to endless changes of temperature and the action of all sorts of water. Accuracy, however, is taken for granted, and the buyer of meters concerns himself principally, as is quite proper, with the durability prospects of the instrument under consideration.

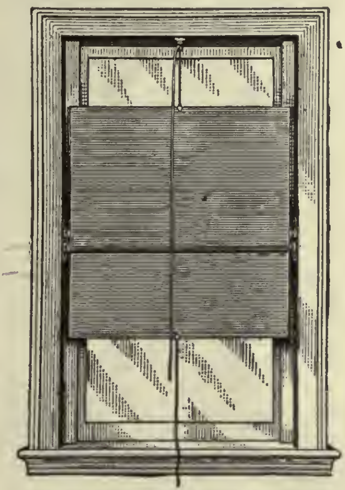
With this requirement in view, a member of the National Meter Company, 299 Broadway, New York City, with a taste for statistics, made an interesting computation some time ago, of the work of one of that company's well known Empire meters, in the ⅝-inch size, that had just made an especially remarkable showing. In the first place it was attached to a ¾-inch pipe and was passing more than twice the proper rating per day, or about 6,000 cubic feet; consequently, although only in service two years and two months, the amount of water registered was over 4,138,000 cubic feet or 31,142,560 gallons.

It was obvious that the piston of this meter had been called upon to do a most unusual amount of traveling in a short time, and the subsequent calculation, made by the statistical observer, showed the distance covered by it, in delivering this amount of water, to have been the equivalent of over 200,000 miles, or eight times around the earth. It would not have been unreasonable to expect that this would have been the end of the career of this palpably over-worked instrument, but on the contrary, with the supply of a new intermediate, and a few minor adjustments, all at a total cost of a little over three dollars, it was restored to its original condition and pronounced by its delighted owner to be "as good as new."

The oscillating piston, which is the characteristic feature of the Empire meter, is the explanation of its wonderful endurance. The piston is so balanced as to water pressure that the flow exerts no strain on it, but simply causes it to move forward in its proper motion, practically floating on the water. The contact of the piston with the walls of the measuring chamber is so gentle that it serves to polish rather than wear them, thus putting the mechanism in the best possible condition for long periods of service.

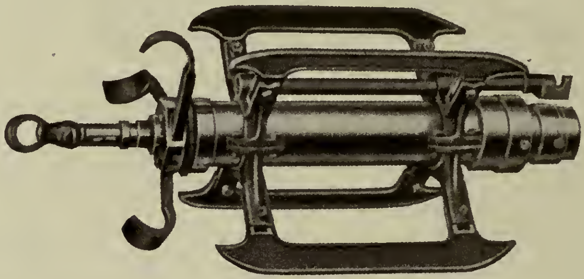
Correct Light and Proper Ventilation for Public Buildings

Unusual care should be exercised in the selection of window shades for such public buildings as schools and hospitals, where the color of the window shades and the method of hanging have much to do with the comfort of the school child or the convalescent patient. It is a recognized fact that certain colors of window shades in schoolrooms cause eyestrain and headaches. Chemists have made a study of this for the Stewart Hartshorn Company, 250 Fifth Avenue, New York City, and have devised two colors in tinted cambric shade cloth which are being used extensively by boards of education in schools throughout the country. In hospitals and sanitariums where it is necessary to darken rooms for the comfort of the patient, dark green or brown should be used.



THE BEST ARRANGEMENT OF SHADES FOR SCHOOL ROOMS

Control of ventilation can be secured by placing two shades at the center of the windows, as shown in the accompanying illustration. When the window is opened from the top the glare is shut out by the lower shade, and if the window is open at the bottom the upper shade is raised. Two short shades at the center of a window hang straight and smooth, roll evenly and wear much longer than one shade covering the whole window. The increased length of life of the two short shades is worth considering for buildings where they are subjected to very hard usage, such as schools and auditoriums.



Turbine Sewer Machine

The Turbine sewer cleaning machine will take care of any sized job in a satisfactory manner.....It cleans sewers of every obstruction...

Used with great success by scores of other cities all over the country

Let us demonstrate this machine without any obligation whatever

Write for illustrated book of facts

Turbine Sewer Machine Co
195 ELEVENTH ST., MILWAUKEE, WIS.

Testing Water Meters for Accuracy

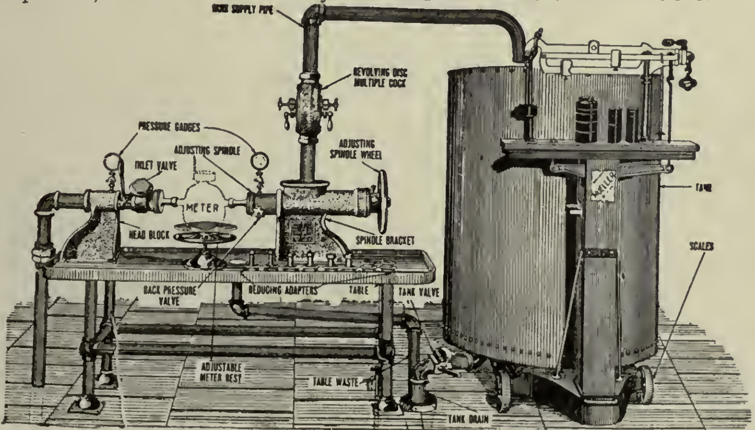
After water meters have been in service for several years, most municipalities and water companies make a practice of testing them for accuracy. This is a protection to the consumer, as well as to the municipality or company, and should be welcomed by the consumer as expressing the desire of the producing agent to serve the consumer properly and accurately at all times.

A meter-testing machine adapted to testing all types of service meters is made by the H. Mueller Manufacturing Co., Decatur, Ill. The tester is made in two sizes, one which will handle meters from ½ to 1 inch in size and the other machine from ½ to 2 inches. A complete set of adapters for fitting all meters to the tester in furnished with each machine. Some meters will properly register a stream of water the full size of the meter, but are defective for smaller streams. As a rule, when a meter is not accurate for a stream of water the full size of the meter, the defect is liable to be greater on smaller streams. For these reasons, the test should be started with a stream of water the same size as the meter and repeated on smaller sizes until the accuracy or inaccuracy of the meter for any size stream is fully determined. Multiple cocks, with different size orifices are furnished with these machines to enable the operator to secure different size streams. Special pressure gauges, able to withstand the shock caused by the sudden closing of the valve, are furnished as a part of the meter testing equipment, and purchasers are advised not to equip testers with their own pressure gauges, which are not adequately protected to withstand the water hammer to which they are subjected.

The scales are especially constructed; in addition to two bars graduated in pounds, cubic feet and gallons, the Mueller water meter beam has a special bar which is graduated in per cent. The purpose of this bar is to determine the per cent of error in a meter. The two bars graduated in pounds, cubic feet and gallons may be used for making small tests or for balancing the scales between the tests without emptying the tank. These bars also enable the error in the meter to be determined in pounds if for any reason it is so desired. The machine has two counterpoises, the front counterpoise used in the customary manner, simply as a balance and for holding the weights that weigh the water used in testing. The per cent counterpoise is used on the per cent bar for determinin the per cent of error in meters. The per cent counterpoise is marked 1 cubic foot, 7½ gallons, 62½ pounds, and is used alone for determining the error when 1 cubic foot or 7½ gallons of water is used in a test. The front of the per cent counterpoise rod is marked 2, 3, 4, 5, 10, 15, 20, 25, 30 and 40 cubic feet. The left side of the rod is marked in gallons and shows the number of gallons equal to the cubic feet graduations on front of the rod. The right side of the rod is marked in pounds and shows weight of water to correspond with cubic foot graduations. When testing with either of these, numbers of cubic feet or gallons of water by weight are built up on the per cent counterpoise to the number desired for determining the error. The per cent counter poise is of itself equal to 1 cubic foot, 7½ gallons or 62½ pounds, and must be so considered when building up combinations of weight. For making a 10-cubic-foot test, the per cent counterpoise is counted as 1 cubic foot, and on it should be placed two 2-cubic foot weights and one 5-cubic foot weight. This will correspond to 10 cubic feet on the per cent counterpoise.

Two sets of weights are furnished with each scale, the larger set is marked in cubic feet, gallons and pounds and is used on the front counterpoise to weigh the water used in the test. The smaller weights are marked in cubic feet, gallons and pounds and are used on the per cent counterpoise to determine the error of a meter when tested with more than 1 cubic foot, 7½ gallons or 62½ pounds of water. For testing small meters, it is suggested that sufficient water should be run through the meter to cause one or more complete revolutions of the indicator on the meter dial.

One of the best ways of comparing the accuracy of different water meters under like operating conditions is by the use of a meter testing machine. In this a group of meters may be tested under identical conditions.



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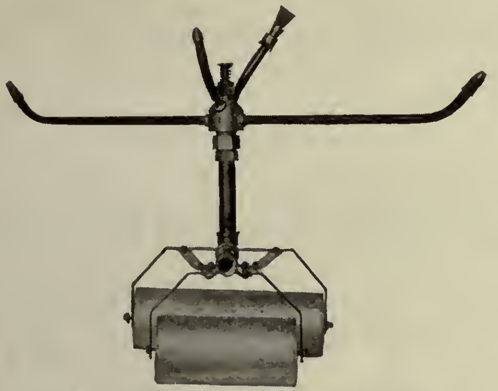


A PRACTICAL LAWN SPRINKLER

A Lawn Sprinkler With Many Advantages

There is something very interesting to the casual looker-on in watching park sprinklers send out their misty sprays over park lawns and golf courses. Many times it is not so interesting to the laborer who must shut off the water and wade over the newly seeded ground which is being sprinkled, in order to move the spraying device to another place. The Buckner No. 3 Sprinkler, illustrated herewith, has particular qualities which overcome the objectionable features from the laborer's standpoint. This sprinkler is mounted on an iron carriage with an all-steel frame and has rollers made of No. 24 galvanized iron, 5 inches in diameter and 15 inches long, with an axle that runs all the way through. They are made for either a 1-inch or a ¾-inch hose connection and are very widely used by golf clubs and park departments in the West, particularly in California, where the long dry season makes it imperative that lawns and parks be watered frequently to maintain the beauty of the grass.

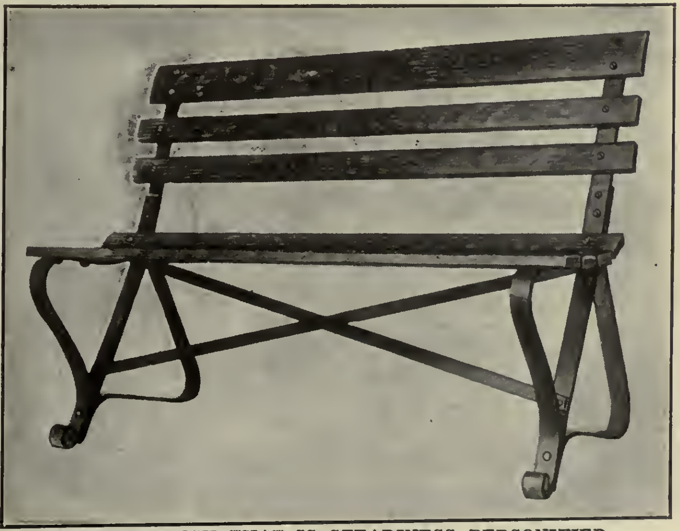
This sprinkler can be pulled from place to place by the hose without causing any strain on the hose and without turning off the water. This saves much labor and also makes it possible to water a newly seeded putting green or lawn without having to walk over the soft, wet ground in order to move the sprinkler from place to place. These and other features are embodied in the well-known sprinkler systems manufactured by W. A. Buckner, 1051 T Street, Fresno, Cal.

City Planning Service

George B. Ford has been appointed Director of the City Planning Department of the Technical Advisory Corporation, 132 Nassau Street, New York. Mr. Ford, who was chairman of the City Planning Committee of the American Institute of Architects and is a director of the American City Planning Institute, has recently been retained as adviser on foreign housing to the U. S. Senate Committee on Reconstruction and Production. Besides his widely known city planning and zoning activities in this country, Mr. Ford has recently completed a long engagement in France, where he was city planning consultant to many of the cities of the devastated areas, including Rheims, Arras and Soissons.

A Comfortable Park Bench That Will Last

The new "Bausman Special" park bench, which has been developed by the Bausman Manufacturing Company, Lancaster County, Bausman, Pa., weighs only 45 pounds. This bench is well based, and comfortable and is the result of months of constant experiment to produce a satisfactory and attractive park bench. Park superintendents and others who have had experience with the rough treatment that park benches receive will be interested to examine this bench, which is built on the best principles developed in the theory of tructures. All bracing makes triangles the strongest element in civil engineering construction. The frame which is made of 1½ x ¼-inch round-edge steel is so strong that with the settee on end, 500 pounds could be placed on the end without any damage. This is not exactly the treatment to which settees are ordinarily subjected, but represents many times the stress developed by people moving along the park bench, and subjecting it to lateral strain. The seven slats which form the seat and back have rounded bases and are made of selected hardwood.



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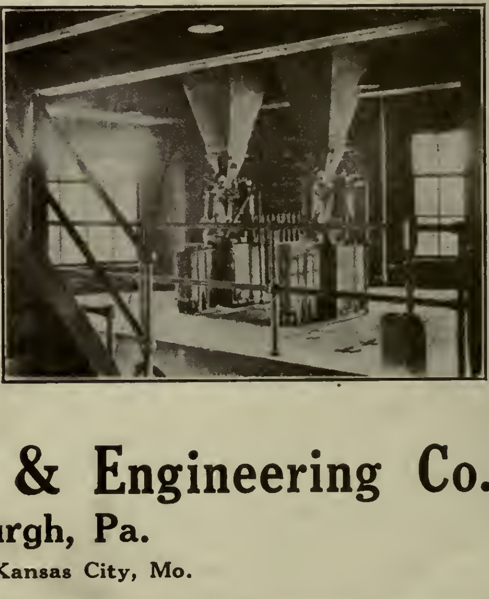

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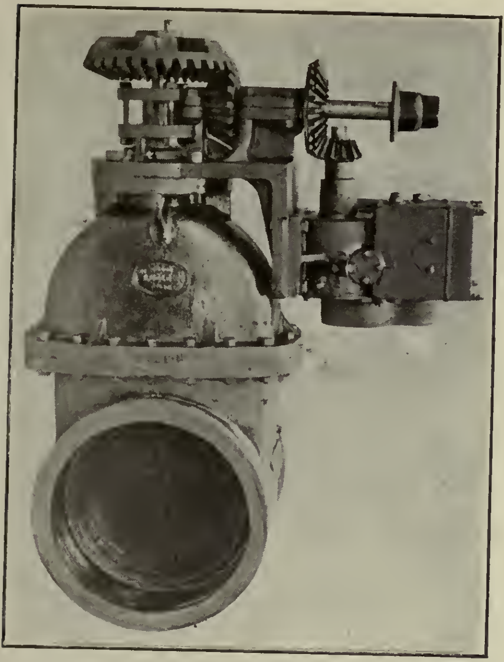


A LUDLOW VALVE WITH DEAN ELECTRIC CONTROL

The Electrical Operation of Heavy Water-Works Valves

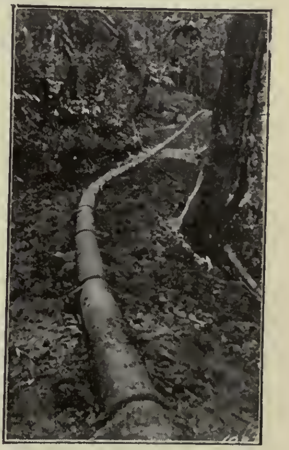
The ready control and operation of large water-works valves is a matter which has troubled water-works officials for many years. The motor operation of pump discharge valves and large distribution valves for water-works would result in tremendous saving in labor each year, as well as in reducing losses due to breaks in water-mains where there are no available means for readily stopping the flow.

There are three types or kinds of power-operated devices for gate valves, namely, hydraulic, water and electric motor. Piston or hydraulic cylinder valves may be used with steam, air or water, the last medium being considered best for general purposes. The cylinders are of cast iron, brass-lined, carrying the ordinary hydraulic plunger, and pressure is admitted either above or below the piston by a four-way cock or valve. In case of failure of water pressure, provision is sometimes made to attach a stem and yoke so that the ordinary hand-wheel operation can be secured. This type, although extremely simple in construction and operation, is not suitable where the temperature is liable to fall below freezing and put the piston out of commission. In addition, this device cannot be attached to existing hand-operated valves. The water-motor has been used to some degree, but it is necessary to have a reversing switch, as the ordinary water-wheel operates only in one direction. This valve is also liable to freeze when not in use in cold weather.

Electrical operation of valves by a motor geared to the valve stem and a limit switch for stopping the movement is by far the most reliable method. There are still some problems to be considered even in this ideal system. The movement of the gate valve must be confined within very precise limits, especially at the closed position. On account of the momentum or over-travel of the motor armature and driving gears after it has been disconnected from the circuit, it is easily seen that these limits are not easily obtained unless some quick-stopping device, such as a solenoid brake, is applied to the motor shaft. Peter Paine Dean, Cutler Hammer Manufacturing Company, 50 Church Street, New York, has developed the Dean system of valve control, which incorporates five distinct features: (1) it is a single-unit system; (2) it can be attached to existing valves with a minimum of effort and without shutting down the line; (3) it is positive in operation and does not depend upon momentum or drift of moving parts to seat; (4) it has ample unseating and seating torque; (5) the whole unit is enclosed and water-proof.

The system consists of a single unit in which are incorporated a driving motor, reduction gears and limit trip mechanism. The feet of the unit are provided with four holding-down bolt holes of standard dimensions for a given range of valves. The motor is totally enclosed and water-proof and possesses an extremely high torque. It is connected to a system of combination worm and planetary gearing for the necessary reduction in speed. The motor speed is normally 1600 R.P.M. and the slow speed shaft 40 R.P.M., the gear reduction being 40 to 1. With different gear ratio incorporated in the same casing a reduction of 120 to 1 or 14 R. P. M. on the slow speed shaft is available. Repeated tests of this system of valve control show its complete success under all operating conditions.

Uses of Universal Pipe



AN EMERGENCY INSTALLATION OF UNIVERSAL PIPE

Universal pipe, the special form of cast iron pipe manufactured by the Central Foundry Company, 90 West Street, New York City, is particularly valuable for emergency installations for water supply or fire lines, because of the rapidity with which it can be laid. No lead, no pouring and no packing are required and wrenches are the only tools necessary for laying it. For permanent installations it has met with success in water service and also for high pressure fire lines.

Horizontal and Verticle Centrifugal Units in both Single and Multiple Stage. Built to meet all requirements. We also specialize in Deep Well Equipment.

Our organization is backed by experience extending over a quarter of a century of pump designing and building.

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Lea-Courtenay centrifugal pumps have been the logical selection of leading water works engineers for years when seeking the highest type of centrifugal pump development.

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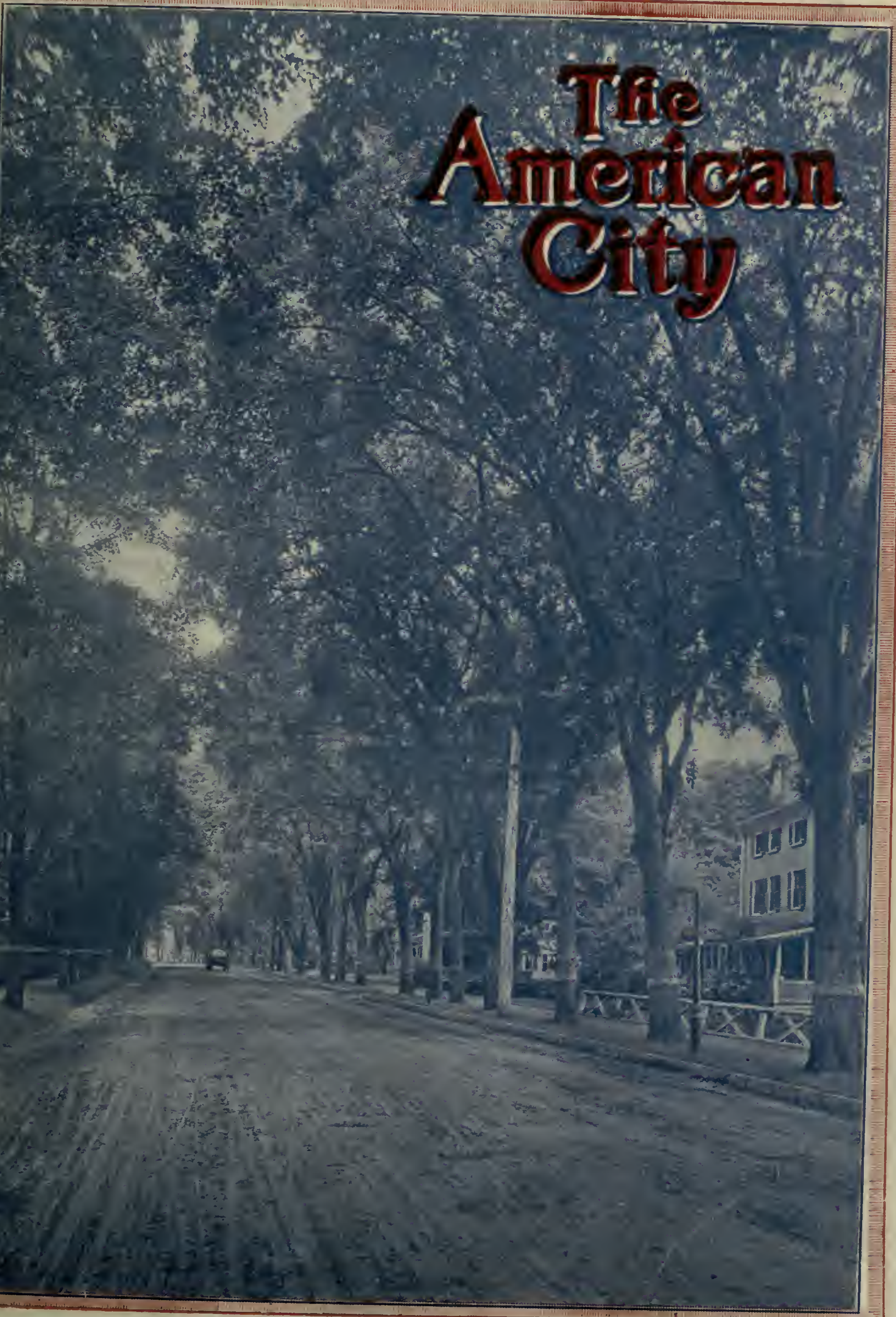
The American City



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The American City

NEW YORK
OCTOBER, 1920

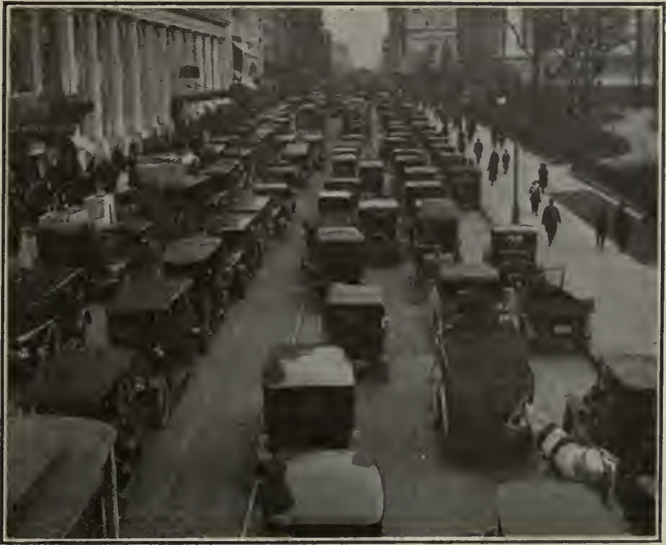
Unchoking Our Congested Streets

By Robert H. Whitten

Advisor, Cleveland City Plan Commission

THE street traffic problem is becoming increasingly serious in all large cities. London and Paris as well as New York and Chicago have found their thoroughfare systems choked with the ever-increasing burden that has been thrown upon them. Numerous other cities, such as Liverpool, Manchester and Birmingham in England, and Philadelphia, Boston, Detroit, Cleveland, St. Louis, Baltimore, Buffalo, Newark, and Kansas City, Mo., in the United States, are having increasingly difficult traffic conditions. Street traffic is increasing so rapidly that roadways that a few decades ago seemed adequate for all time have become so congested as seriously to menace the prosperity of the city.

Street traffic is increasing much more rapidly than population. If the growth of street traffic merely kept pace with the growth of population, the problem of making adequate provision for the future would be sufficiently difficult. It is probable, however, that the street burden will under normal conditions increase twice as fast as population, that is, while population is doubling the street traffic will be trebled. As a city spreads out and distances become too great for walking, it is natural that the per capita number of rides by vehicle and car should increase. This is shown very clearly in the street railway and rapid transit statistics of various cities. These statistics show that, in general, rides have increased as the *square* of the population, that is, as population has doubled, the number of car rides has quadrupled. The result has been that as various cities have grown in population and area, a point has been reached where it has become physically impossible to handle a sufficient number of street cars at a reasonable speed over



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SEVEN LINES OF TRAFFIC AND A DOUBLE-TRACK CAR LINE CONGEST FORTY-SECOND STREET, NEW YORK the surface of the streets to carry the traffic. As a result, it has been necessary to supplement the street surface by elevated railroads and rapid transit subways.

Effect of the Automobile on Street Congestion

With the advent of the automobile a new facility for city transportation has been introduced which is placing a very much increased burden on the streets. The speed and convenience of the automobile as compared with the street car as a means of getting about town has led to its use in enormous numbers in cities where conditions were favorable to its full development. In some of these cities the private automobile and the jitney have caused a serious decline in the revenue of the street car companies. The private automobile takes from two to twenty times as much street space per passenger carried as does the street car. Moreover, every improvement in transportation causes an increase in the number of rides per capita. The automobile, therefore, causes a direct increase in the normal increment of rides per capita while at the same time causing an increase in the average amount of street space required per passenger carried.

The possible combined effect of these two causes on street congestion is alarming. Of course, there is this offset. The moment street congestion becomes so great that the automobile as compared with the street car or rapid transit train is no longer the more convenient and expeditious method of travel, the use of the private automobile will decline. This is illustrated in the present comparative use of the automobile in various cities. In the cities of moderate size with adequate streets, smooth pavements and favorable weather conditions, the use of the private automobile as a means of city transport has been most general. On the other hand, in cities like New York and Chicago, where, prior to the advent of the automobile the streets in the business sections were already badly congested, the introduction of the private automobile has been much slower. In those cities the tendency has been for owners of automobiles to use them for pleasure and for business and social calls outside of the congested centers, but to rely on the railways for transportation to and from their work in the central business section and for business calls in that section. The demand, however, is becoming insistent that traffic conditions be so improved that the private automobile can play its normal part in the business of the city. This may necessitate radical changes in traffic methods. It may be necessary to segregate traffic and provide for a complete or partial separation of grades. But whatever the solution, we may be sure that its difficulty and cost will be in inverse proportion to the liberality with which the city has been provided with broad through-routes.

The Effect of the Motor Truck

While the private passenger automobile increases the burden on the street per passenger as compared with the street car, the motor truck tends to reduce the street burden per ton of goods as compared with the horse-drawn vehicle. This is chiefly due to the greater capacity, speed, reserve power and facility of movement of the motor truck. The substitution of the motor truck for the horse truck and delivery wagon means a very great relief to congestion.

The extent to which the motor truck will be used and the rapidity with which it will supersede the horse truck depends directly on the adequacy of the thoroughfare system. The motor truck involves a large investment as compared with the horse truck, and unless traffic conditions are such that a fair rate of speed can be maintained, the use of the motor truck will be uneconomic for most purposes. But, given an adequate thoroughfare system, the development of the motor truck for city and interurban transport is now only in its infancy. It will not only replace the horse truck, but will encroach on the railroad and will develop many new fields of usefulness.

Traffic Increase vs. Growth in Population

Under modern conditions it seems to be a general law that passenger travel and goods transportation will greatly outstrip the increase in population. This results from increase in productive capacity and consequent consuming ability of the people and from improvements in the art of transportation resulting in greater economy and convenience. Our greater productive power per capita makes it possible to spend more, and every improvement resulting in greater economy or convenience of transport creates a demand for more transportation both of goods and passengers.

This is shown both by all available statistics of city passenger and vehicular traffic and by statistics of railroad freight and passenger traffic for the United States. The percentage increase in railroad freight tonnage in the United States for varying periods since 1890 has been 2.25 to 5 times as great as the percentage increase in population, the average being about 3.5 times. For similar periods railroad passenger traffic has increased from 1.25 to 2.75 times as fast as the population, with an average about two times. City passenger travel has increased from 2 to 3 times as fast as the population. As a city's railroad freight terminal tonnage is in large measure hauled through the streets, it is especially significant that such statistics as are available both for Cleveland and Chicago indicate that the freight tonnage of each is increasing about two times as fast as the population. On Fifth Avenue, New York City, traffic increased 1.5 times as fast as the population during the period 1885-1904 and 1.8 times as fast as the population during the period 1904-1917. In St. Louis, traffic on five principal streets increased two times as fast as the population during the period 1885-1917. In Paris, traffic on four streets increased three times as fast as the population during the period 1881-1912. These increases tend to confirm the estimate based on other available data that the minimum probable percentage increase in street traffic is at least two times as great as the percentage increase in population; that is, while population increases 100 per cent (doubles) traffic will increase at least 200 per cent (trebles).

The above is a conservative estimate and is undoubtedly entirely too low as an estimate for the next five or ten years. Not until the number of automobiles in use is nearer the saturation point will an estimate of traffic increase only two times as great as the increase in population be justified. In 1910 there were 500,000 motor cars in use in the United States; in 1918 there were 6,088,000. The percentage increase in the number of motor cars was 77 times as great as the percentage increase in population. In 1913 there were 14,098 motor car licenses issued in Cuyahoga County, Ohio; in 1918 there were 61,087. The percentage increase in the number of motor cars was 13 times the percentage increase in population. During the last five years, owing to the enormous development of the automobile, traffic has increased many times as fast as population. In Newark, N. J., during the period 1912-15 traffic increased 3 times as rapidly as the population. In Brooklyn during the period 1914-18, based on counts on three typical streets, traffic increased 6.2 times as fast as the population. In London, during the period

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TRAFFIC ON FIFTH AVENUE, NEW YORK, INCREASES NEARLY TWICE AS FAST AS THE POPULATION

1911-14, traffic increased 6.4 times as fast as the population. In Buffalo during the period 1909-16, based on counts at eight intersections, traffic increased 7 times as fast as the population. In St. Louis, during the period 1913-17, traffic increased 8.7 times as fast as the population. On Massachusetts highways, during the period 1909-18, traffic increased 14.5 times as fast as the population.

The unusual increase in traffic due to the automobile is by no means spent. It will doubtless continue for five or ten years longer. For an estimate, therefore, of traffic growth during the next five or ten years the rate of population increase should be multiplied by four or more instead of two. But for the longer look ahead, say the next twenty or forty years, it is safe to use the rule heretofore worked out, that the probable rate of traffic increase will be twice the expected rate of population increase.

The Important Element of Speed

The traffic problem is chiefly one of average speed and not of the number of vehicles it is physically possible to move through the streets. Even with all the interruption due to cross-traffic, there is abundant street capacity in so far as the number of vehicles that it is possible to pass through the streets during any 2- or 12-hour period is concerned. All the traffic offering can doubtless be taken care of—the only question is with what delay and with what average speed. If an average speed of 2 to 6 miles an hour will suffice, there is no traffic problem now and possibly never will be. If, on the other hand, an average speed of 10 to 20 miles an hour is demanded, the traffic problem is extremely urgent and difficult.

The cost of street congestion in a city like Chicago, New York or London can scarcely be exaggerated. In the loop district of Chicago street cars are slowed down in the rush hours to average speeds of 3.5 miles and 5 miles an hour. In Cleveland the average speed of street cars for the city as a whole is about 10½ miles an hour. In the vicinity of the Public Square the average rush hour speed is about 6 miles per hour. As the business district of Cleveland expands and extends further and further east, we may expect the existing congestion on lower Euclid Avenue to extend to a large area including many narrow streets. A street car service that must travel even 2 miles through congested streets at a speed of 3 to 5 miles an hour is not a service that can succeed financially, and it will certainly be most unsatisfactory to the public. It will waste time and lead to the congestion of population. Rapid transit railroads will help this situation, but they are enormously expensive, and in New York City, where a fairly complete system of elevated and subway rapid transit has been provided, it has not been found feasible to abandon the surface car lines. An adequate thoroughfare system will postpone the time when a complete subway system will be required, and will greatly reduce the cost of such system when it is constructed. For Cleveland the present cost of the necessary street widenings and extensions to provide a complete thoroughfare system will during the next fifty years be saved many times over in lessened expenditure for rapid transit subways.

Extreme congestion means not only that street car service is disrupted, but that all trucking and commercial traffic is slowed down. The cost of trucking is a much larger factor in the cost of most goods than is railroad freight. Many products are transferred by vehicle through city streets a half-dozen or more times before they reach the consumer. If, through street congestion, as is undoubtedly true in parts of Chicago, New York and London, the time and cost of trucking goods is doubled, the toll due to congestion is certainly enormous. It is paid in part by the public in higher prices. It also places a serious handicap on city commerce and industry.

A thoroughfare plan that will serve adequately the enormously increased needs of the future is a critical problem for many cities. After streets are built up solidly with business buildings and apartments, it becomes almost prohibitively expensive to alter greatly the general street plan. Yet it is apparent that the limited number of through traffic routes that these cities now possess will be absolutely inadequate for traffic needs twenty, fifty or one hundred years hence. Unless measures are taken in time, growth will be checked and the city may be faced with the alternative of permanent ruin or back-breaking financial burdens that could have been avoided by a little vision in the planning of the city.

A City Transformed by Water

City and County Joined in Providing Funds for New Ship Channel at Houston, Texas

By Burt Rule
Publicity Director, Houston, Texas, Young Men's Business League

NOT so many years ago the average person residing in a section other than the extreme Southwest, and possessing a normal fund of knowledge regarding the geography of these United States, thought of Houston, Texas, as an inland city located somewhere in South Texas. To-day, the information is being rapidly disseminated not only throughout America but to all the great ports of the world that Houston, Texas, is a deepwater port where seventeen railroads meet the sea.

The underlying cause of Houston's transformation from comparative obscurity to fame has been the development of her deep waterway, the Houston Ship Channel, which has literally brought the Gulf of Mexico to her door. This strip of water is Houston's medium of commercial communication.

Consideration is now being given the Port of Houston as the natural export and import gateway of that vast area lying between the Rocky Mountains and the Mississippi River.

In addition to definite plans of action looking to the continuous development of the waterway itself, the Port of Houston possesses another natural advantage which renders less difficult of acceptance certain "staggering" predictions that have been made. It has the most extensive deep water frontage, available and practicable for industrial use, of any inland port in the world.

With a view to the systematic development and control of the harbor, the city of Houston took advantage of an act of the Legislature in 1913 and extended its limits to include the channel down to its entrance into Galveston Bay and the territory lying along the channel for a distance of 2,500 feet from the center of the waterway. The city has not the power of taxation over this area, but harbor police operating from the office of the city harbor department patrol the entire harbor within the jurisdiction of the city—a distance of 33 miles.

A PORTION OF THE HOUSTON, TEXAS, MUNICIPAL DOCKS

The Houston Ship Channel occupies a natural waterbed, which before the creation of the channel was known as Buffalo Bayou. From the turning basin at Houston to the open gulf, Houston's waterway traverses a distance of 54 miles. The ruling depth is 25 feet. The bottom width of the channel is 100 feet from the turning basin to Morgan's Point and 150 feet from Morgan's Point to the gulf waters, except in the vicinity of Red Fish Reef, where the width is 250 feet to allow freedom to the tide. The turning basin has a radius of 1,100 feet, which is sufficient to take care of the largest vessels. At six points the channel has been widened an additional 100 feet to facilitate the passing of large vessels.

Public Funds Made Channel Possible

The present development of the channel and of the harbor facilities has been brought about through the public-spirited action of Houston citizens in conjunction with financial assistance obtained from the Federal Government. To date a total of approximately $6,700,000 has been expended in this work, of which $1,500,000 has been contributed by the citizens of Houston and Harris County.

On May 24, 1919, Harris County voted a bond issue of $1,500,000 as its share of the expense of improvements as authorized by Congress. The total cost of these improvements will approximate $3,850,000. When they are completed, a total of $10,500,000 will have been spent on the actual construction of the channel. Congress has agreed to appropriate one-third of a million dollars annually to maintain the depth and width authorized.

Practical work on these further improvements of the channel has been started. When it is completed, the ruling depth will be 30 feet with a bottom width of 150 feet from Morgan's Point to Houston and 250 feet from the former point to the gulf. Curves in the channel will also be straightened.

In consideration of the ultimate improvements planned, restrictions in regard to dock construction are effective at once. There is other practical evidence indicating that Houston will eventually possess a waterway 500 feet in width from Houston to a point approximately halfway to the gulf and 600 feet the remainder of the distance. Several additional turning basins will be provided to permit boats to clear at various points along the channel. It is probable that the mouths of the many small streams tributary to the channel will be utilized for this purpose. The channel will be lighted by range lights and thus permit vessels to travel the waterway at all times of the 24 hours.

The Value of Industry and Control

A contributing factor to the rapid growth of the Port of Houston is the Municipal Harbor Belt Railway. It now has more than 15 miles of track and reaches most of the industries on the south side of the channel from the turning basin to a point about 6 miles down the channel. It is contemplated to extend the line to Morgan's Point on the south side, a distance of 18 miles, and on the north side to the vicinity of Goose Creek, the famous oil field, to connect with a railway which has just recently been completed to that point.

Completion of this project will give all industries located on the channel a unique combination of facilities. They will have deep water at their front doors and also direct rail connection with seventeen railways.

Houston, profiting by a study of other ports of the country, has striven to eliminate the possibility of corporation monopoly by a construction program of municipal terminal developments coincident with the completion of her deep waterway. A bond issue of $3,000,000 was voted, and the funds thus obtained were expended for the municipal harbor terminals as they stand to-day. Improvement and expansion of the present harbor facilities by the city will be continuous for several years.

A valuable adjunct to the Houston Ship Channel is the upper channel of Buffalo Bayou, extending from the turning basin to the center of the wholesale district. Barges of light draft and lighters navigate this channel without difficulty. Numerous warehouses are located on the upper channel and they ship direct by water to the turning basin of the ship channel. During 1918 approximately 500,000 tons of freight, representing more than $14,000,000, were transported over this upper waterway. This tonnage does not include cotton shipments, which have always comprised an important phase of the channel's activities.

The Houston Ship Channel has the distinction of being a very large oil refining center. There are eight refineries in actual operation on its banks, six are under construction and five more have obtained sites with the announced intention of starting construction at the earliest possible date.

Activities of the Port of Houston

A report of the activities of the Port of Houston covering the year 1919 amply demonstrates it is no longer a deepwater port in name only. During that period 155 steam vessels called at and cleared from the port and unrigged vessels visited the port more than 4,000 times. The total of exports and imports aggregated 1,287,972 short tons. Coastwise vessels delivered cargoes valued at $52,588,291. The tonnage of cargoes destined for foreign ports during 1919 fell far below that which will be chalked up for 1920. This difference will have been brought about by the large shipments of cotton to Liverpool, which were inaugurated early this year. In 1919 the foreign tonnage amounted to 13,673.

Recent developments have proved to the satisfaction of the most doubting that the dream of the Houston pioneers of fifty years ago, for which they and present Houstonians have worked hard and long, has come true. The Port of Houston has been made a port of call for vessels from every quarter of the universe! Ships are clearing from the Port of Houston for Mexico, England, Cuba and ports along the Atlantic seaboard. Vessels allocated to the port by the United States Shipping Board have within the past few months carried huge cotton cargoes to Liverpool, England. The Leyland Line of England, it is announced, will also inaugurate regular sailings from Houston to Liverpool. An additional steamship service from Houston to Mexican ports was placed in effect in February of this year. The number of sailings of this line has already been increased.

For the past two years regular steamship service between Houston and Philadelphia has been in effect. The volume of business of this line has increased from two sailings a month to as many each week. For several years oil tankers from Tampico, Mexico, have delivered their cargoes to Houston refineries via the Houston Ship Channel. Negotiations are now under way that assure for Houston a number of additional coastwise lines. The actual operation of these additional lines depends only upon time for the completion of additional wharf facilities, finances for which are now being raised.

A SUBSTANTIAL AND ARTISTIC REINFORCED CONCRETE ARCH BRIDGE

Enlarging a Sewage Disposal Plant

Heavy Load from Shipyard on Plant at Harriman, Pa., Necessitates Additional Works

By Frederick Glaeser

Fomerly Engineer, U. S. Shipping Board Emergency Fleet Corporation

IN connection with the industrial housing development at Harriman, Pa., the employes of the Merchant Shipbuilding Corporation, Agent for the United States Shipping Board Emergency Fleet Corporation, certain extensions were required to the existing sewage purification works of the borough of Bristol at Bristol, Pa. The Bristol shipyard is located on the Delaware River just outside the corporate limits of the borough of Bristol, and is about 24 miles east of Philadelphia. The housing development adjacent to the shipyard comprises approximately 120 acres, consisting of 532 houses, stores buildings, hotel, schoolhouse, police and fire headquarters, hospital, central heating plant and numerous other buildings.

The sewerage systems of both the shipyard and the town site are of the separate type. The storm water sewers empty into the Delaware River at the extreme easterly and westerly limits of the plant. The sanitary sewers, which consist of various sizes of laterals and collectors of vitrified terra cotta pipe, all finally empty at one point into a 24-inch terra cotta extra heavy tile pipe. This 24-inch pipe conducts the sewage from the town site and shipyard for a distance of almost 6,200 feet to a pumping station that is situated just outside the borough of Bristol limits. This pumping station was originally built by the borough, but was inadequate to meet the additional load thrown upon it by the sewage from the town site and shipyard, so extensive additions and alterations have been made to it. From the pumping station the sewage is conducted through a 16-inch cast iron force main to the disposal works distant about 1,600 feet farther west.

The Original Bristol Plant

The purification plant of the borough of Bristol consisted of four sedimentation tanks 19 x 60 x 7 feet deep, two settling basins 36 x 23 x 7 feet deep, contact beds that were 21,500 square feet in area with 4.5 feet depth of stone, disinfecting tank 50 x 90 x 4 feet deep, sludge beds 31 x 40 x 3 feet deep, and a sludge digestion tank 25 x 50 x 9 feet deep with a chamber 25 feet diameter, 7 feet deeper.

This plant was extended in 1917 to provide for a portion of the sewage that was discharged from the shipyard and temporary bunk houses of the construction forces that were then in course of construction. The additions consisted of an increase of 10,000

CONSTRUCTION PICTURE SHOWING REINFORCING STEEL FOR IMHOFF TANK NO. 2

square feet in the area of the contact beds; an increase of 6 inches in the height of the filter-bed walls and the depth of stone, and a chamber in which proper distribution was made of sewage onto the filters.

INTERIOR OF COMPLETED IMHOFF TANK SHOWING SLUDGE SLOT

In the spring of 1918 the permanent population in the new town site contributing sewage was considerably increased and it was necessary to prepare definite plans for a permanent disposal plant to provide for the permanent requirements of the shipyard and town site. It was proposed by the engineers of the Emergency Fleet Corporation to construct a disposal plant of the Imhoff type with rectangular form of tank.

Designs were prepared by the Bristol Engineering Department based on the following assumptions: assumed ultimate population in town site, 8,100; additional area provided for outside of present town site, 190 acres; assumed ultimate population of additional area, 3,800 (density of population assumed much lower than in new town site because development will probably be along different lines); assumed ultimate population in shipyard plant, 11,100; total ultimate population, 23,000; present population, approximately 13,000.

RESULTS OF TESTS ON SEWAGE FROM TOWN SITE AND SHIPYARD

Date	Average C.F.S.	Flow Gal. per Day	Population Tributary	Flow Gal. per Cap.
7/24/18...	0.61	395,000	10,000	39.6
8/28/18...	0.84	545,000	12,500	43.6
9/ 4/18...	0.90	585,000	13,000	45.0
9/10/18...	0.97	630,000	13,000	48.4
9/11/18...	1.19	772,000	13,000	58.4
9/12/18...	0.80	520,000	13,000	40.0
Average of last four readings.	0.97	627,000	13,000	46.0

Assumed 55 gallons per capita per day as average future flow.

Ground water assumed at 60,000 gallons per day per mile of sewer.

Assumed average maximum flow—2.09 times the average daily flow.

Assumed extreme maximum flow—3.11 times the average daily flow.

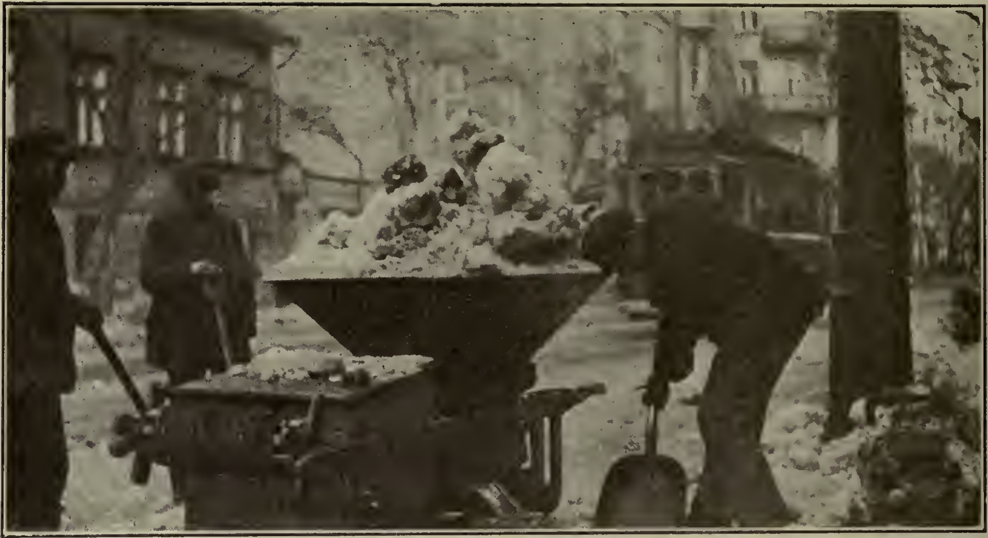
Assumed average maximum flow—0.30 times the average daily flow.

Suspended solids as determined from samples—170 parts per million.

The New Plant

The design as finally approved consists of a tank having inside dimensions of 88 feet 6 inches length by 63 feet 2 inches width divided into three compartments which are so designed that one-third or two-thirds or the whole installation may be in service at one time. The design also permits of the reversal of flow. The bottoms of the tanks are inverted pyramids with steep sides having a slope of 1 on 2. The sludge withdrawal pipe is placed in the center at the lowest point. The flow line of the tanks was placed at such an elevation that the installation of sprinklers on the present filter-beds would be feasible and economical if required in the future.

The specifications for the construction of the tanks provided for a water-tight structure and were very rigid. The concrete in the walls was required to be placed in one operation from the footing up to the top, so that no construction joints except those designated were allowed. The construction joints permitted were at the top of the wall footings, at the junctions of the interior walls, and at the junctions of cross-walls with the outside walls. The faces of the slabs forming the sedimentation hoppers were required to have a smooth finish. These slabs being 6 inches thick and on a 60-degree slope presented considerable difficulty to the contractor.



A SNOW MELTER IN USE ON THE STREETS OF HELSINGFORS, FINLAND

A Snow-Removal Method Used in Finland

A Unique Snow-Melter Devised and Operated in Helsingfors

WHILE the weather prophets have not yet informed us as to what kind of winter is to be expected for 1920-1921, many American cities are carefully equipping themselves with the higher types of snow-removal apparatus, to enable them to combat blizzards similar to those encountered last winter. In fighting the rapid succession of blizzards in February, 1920, almost every conceivable kind of machine was brought into play. Tractors dragged road graders over the highways to open up the roads for traffic. A heavy snow tank appeared on the streets of New York, tearing up the ice and delivering it to motor trucks. An ingenious flame thrower was devised and mounted on the front of a motor truck. Snow-plows driven by motor trucks were found effective when kept in constant use. In Boston and other cities, locomotive cranes were seen on the streets, equipped with buckets which lifted the huge cakes of snow and deposited them in trucks which emptied them into the sea.

Interesting information from Helsingfors, Finland, tells of a snow-melting machine which was developed after ten years of experiment by a Finnish engineer. The idea underlying the construction of this successful machine, which has been used in a number of cities in Finland, Scandinavia and Russia, is to force the hot air and combustion gases from a furnace straight through the snow which is to be melted. This is done in such a way as to give a thermal efficiency claimed to be over 85 per cent.

Construction of Machine

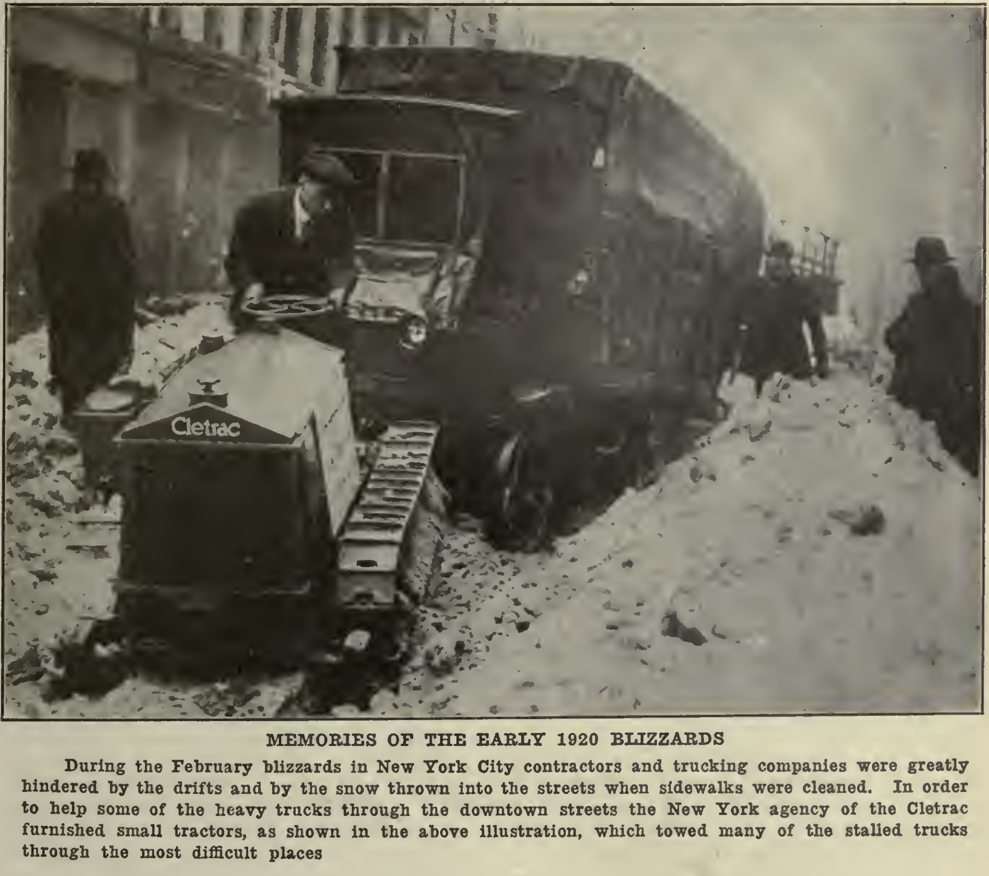
The "Fennia" snowmelter consists of a welded furnace of iron sheeting, water-jacketed all around to keep it from damage through the tremendous heat generated, and to avoid a radiation of heat. A specially shaped water-cooled cover with suitable openings for the even distribution of the heated air and combustion gases tops the furnace. A removable snow-receptacle surrounds this cover and the upper part of the furnace, which on the outside is equipped with a system of ducts for collecting and expelling the melted water, sand and dirt. A high-speed blower, suitably housed and driven by a small electric motor or gas engine, drives a strong current of air directly into the furnace, causing rapid combustion. The hot air and gases are driven straight into the snow, causing it to melt very rapidly. The machine is practically smokeless, because of the completeness of combustion.

Melting Capacity and Cost

The melting capacity varies according to the size of the machine, the power of the motor and the heat value of the fuel used. The smallest model, shown herewith, has a one-horse-power motor, weighs about 675 pounds, requires four men to shovel in the snow, and melts between 5 and 10 tons of snow per hour. Good firewood gives a melting result of 5 to 6 tons, coke 6 to 9 tons, and anthracite and liquid fuel, such as kerosene or gasoline, gives 8 to 10 tons per hour. The smallest model consumes about 275 pounds of wood, 225 pounds of coke, 200 pounds of anthracite, 12 to 15 gallons of gasoline or kerosene per hour. This snow melter has been in use over eight years at even very low temperatures. At minus 4 degrees Fahrenheit it has been seen to give out a large volume of slightly warm water running a continuous stream which did not freeze in the gutter, but ran easily several hundred feet to the nearest catch-basin.

In Finland, a number of towns of ten to fifteen thousand inhabitants use this melter, and in the capitol, Helsingfors, the street cleaning department has a large number of them for use on the main streets.

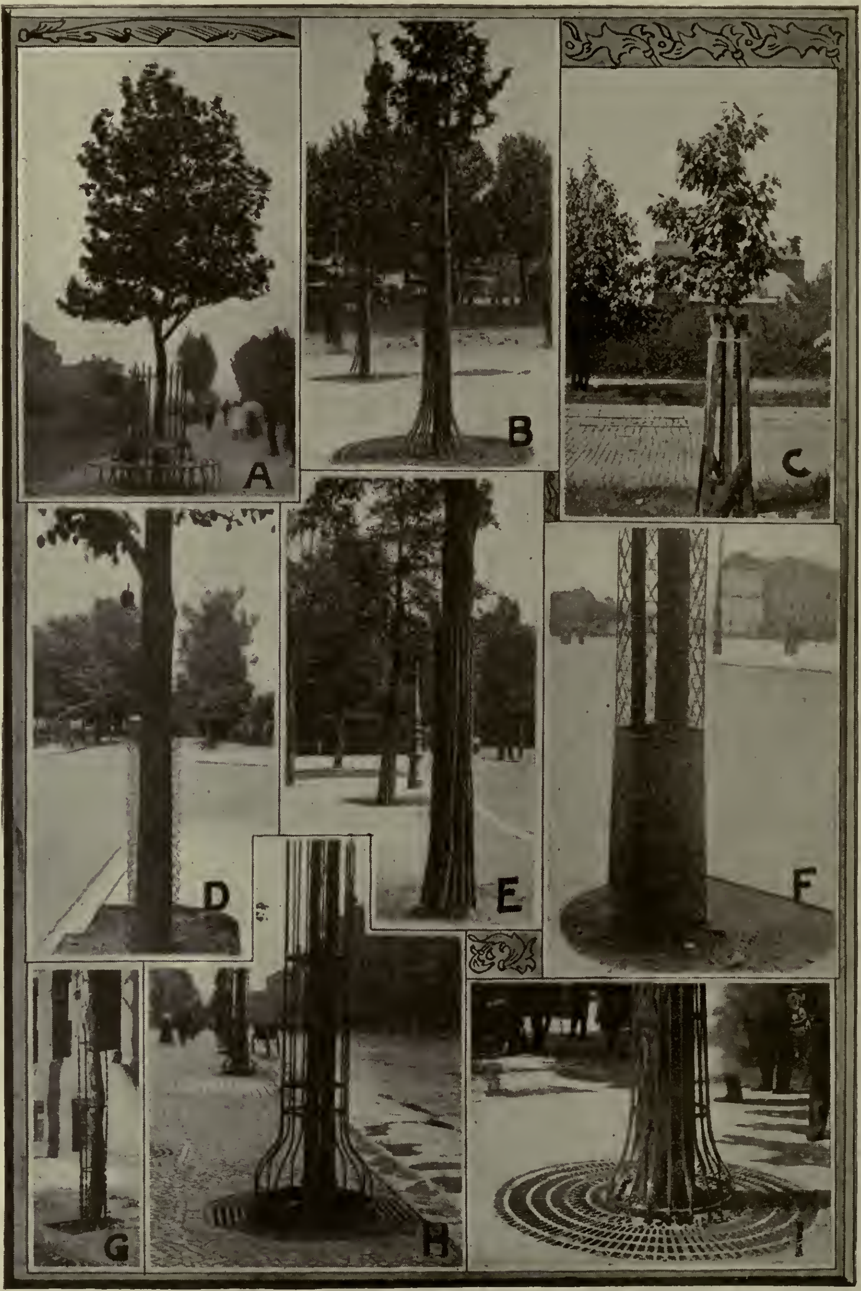
Towing Stalled Trucks in New York Streets, February, 1920



MEMORIES OF THE EARLY 1920 BLIZZARDS

During the February blizzards in New York City contractors and trucking companies were greatly hindered by the drifts and by the snow thrown into the streets when sidewalks were cleaned. In order to help some of the heavy trucks through the downtown streets the New York agency of the Cletrac furnished small tractors, as shown in the above illustration, which towed many of the stalled trucks through the most difficult places

Types of Tree Guards



(A) A heavy guard of iron rods, about which is placed a seat providing a comfortable resting place for pedestrians and at the same time adequately guarding the tree. (B) A heavy guard of metal rods placed closer to the tree than in the first instance and provided at the base with a metal grating permitting sunlight, air and water to reach the roots of the young tree. (C) A sturdy guard made of wood, which may be painted or stained green to harmonize with the grass plot in which the young maple is planted. (D) A woven-wire guard which may not prove adequate where horses can reach from the gutter to the tree, inasmuch as this can be pressed up against the tree, enabling the horse to cut the bark through the mesh. (E) A novel guard of 1- to 1½-inch poles extending from the roots well above the danger zone. Because of its natural appearance it is very inconspicuous from the street and walk. (F) A woven-wire guard supported by a pole driven into the ground and having a heavy galvanized iron base to prevent damage of the lower portion of the tree above ground. This woven-wire protection is far more satisfactory than that shown in D. (G) Guard of twisted iron rods spaced too far apart, thereby permitting horses to attack the trees. (H) A somewhat similar guard to that shown in B. (I) The same guard shown in B, but in greater detail.

The Public Utilities of Melbourne, Australia

The Unusually Well-equipped Power Plants of These Municipally-Owned Utilities Prove Economical

IN order to fully understand the operation of public utilities in Melbourne, Australia, one must know the organization of the city administration. The Council of the city of Melbourne consists of thirty-two members, eight of whom are aldermen representing the eight wards of the city. The Council is presided over by a Lord Mayor who is elected annually by members of the Council. The permanent committees of the Council are: Public Works, Health, Finance, Markets, General Purposes and Legislative, Hackney Carriage, Electric Supply, Abattoirs and Cattle Market, Town Hall and Baths, Parks and Gardens, Alexandra Park, Insurance Special.

The metropolitan area of Melbourne, with an acreage of 163,366, has a population of approximately 724,000 and a valuation of nearly £9,000,000. The functions of the city include control of the traffic, the control of licensed vehicles for hire, roads and footways, storm-water drains, bridges, parks, gardens and playgrounds. The operation of wholesale and retail markets for fruit and vegetables, produce and general merchandise, public weigh-bridges, public abattoirs and markets for cattle, sheep and pigs, horse bazaars, electricity for light and power, health functions, infectious diseases and hospitals, inspection of food premises, owners of real estate, etc. Water and sewage, tramways and fire brigades are controlled by three separate boards. The control of the police for the entire state is under the state department.

Within the city proper the total area of parks, lands and reserves is 1,834 acres. Of this, 49 acres are vested solely in the City Council, and the Council as a committee of management has under its control 13 parks, gardens, reserves and squares with a total area of 525 acres. In addition to the foregoing, 53 acres of parks and gardens are controlled jointly by the Board of Land and Works and the city corporation, and an area of 1,210 acres, which consists of Crown lands and lands vested in special trustees, is

A SCENE ON COLLINS STREET, MELBOURNE, AUSTRALIA also within the boundaries of the municipal corporation.

Electric Supply Department

The city of Melbourne has been lighted by electricity from its own power house for 26 years, and the growth of the electric supply department during this period is of interest. The original plant for lighting the city electrically was obtained in 1892. Altogether, 650 arc lamps and 1,200 incandescent lamps were installed on what was known as the Thomson-Houston series, then in universal use for such purposes in the United States. At the power house four 300-horse-power engines for local manufacture were installed with 24 arc dynamos each capable of supplying 50 arc lamps. The total capacity of this plant was 1,200 horsepower, whereas to-day the plant capacity installed and on order amounts to approximately 35,000 horse-power. This system of street lighting was in use until the year 1906, when it was replaced by one of a more modern nature.

In 1897 the Council extended the plant so as to make available a supply to private customers. This supply was in the form of single-phase, alternating current, generated at 2,000 volts and transformed to 100 volts at the consumers' premises. Until 1901 the distribution of current was effected solely by overhead wires carried on poles, but in that year a system of underground mains was substituted in the central portion of the city, to give a supply of direct current at 230 and 460 volts. At the same time the Council completed arrangements for taking over the interests of the three private companies which were then engaged in supplying electricity to consumers in the city. The cost of this transfer amounted to about £50,000, exclusive of a sum of about £30,000 which was spent in rewiring consumers' premises to enable them to be connected to the Council's supply system. Five small direct-current generating plants aggregating about 2,000 horse-power, which were installed at the power house in connection with this development, have since been sold to make room for the latest extensions.

Further extensions to the plant at the power-house and at the Heffernan Lane substation have taken place at various times. These are listed in the following table:

1905-6—Two 1,000-horse-power Allen Crompton direct-current generators
1907—One 1,000-horse-power Allen-General Electric direct-current generator
1907—Two 1,000-horse-power British Westinghouse single-phase turbo generators
1910—One 2,000-horse-power Allen-General Electric direct-current generator
1912—Four 2,000-horse-power British Westinghouse rotary converters
1912—One 2,000-horse-power Tudor battery
1913—One 1,300-horse-power British Westinghouse rotary converter
1913—One 3,300-horse-power Belliss Siemens three-phase turbo generator
1914—Two 5,500-horse-power Willans Siemens three-phase turbo generators
1914—One 2,000-horse-power British Westinghouse rotary converter
1918—One 7,300-horse-power British Westinghouse three-phase turbo generator
1919—One 2,600-horse-power General Electric Company U. S. A. rotary converter

Provision has also been made for the necessary boilers and auxiliary plant to supply the steam necessary for this additional generating plant. To meet the expected demand of the winter of 1920-1921, one 6,600-horse-power General Electric Company, U. S. A., frequency changer was ordered. This machine will deliver 6,600 volts at 50 cycles at the power-house bus bars from a 20,000-volt, 25-cycle supply transformed down to 6,600 volts at 25 cycles. The energy is supplied by the Victorian Railways Newport power-house.

As an ample supply of cooling water is necessary in order to obtain the highest economy from turbo generators, a new system of supplying water from the River Yarra is in operation. A tunnel of reinforced concrete has been constructed from the river to the power-house, where four large centrifugal pumps have had to be erected to raise the water and circulate it through the condensers. Each of these pumps is driven by a 125-horse-power motor and is capable of dealing with 500,000 Imperial gallons per hour. To give an idea of the amount of cooling water required for a modern turbine, it may be pointed out that the 7,000-horse-power turbo generator on order will at full load require 350,000 Imperial gallons of water per hour to be continuously flowing through its condenser. The maximum capacity of the tunnel will suffice for about 30,000 horse-power of generating plant.

Although the primary object in installing these three generators is to supply, through the medium of the converters, direct current to the central portion of the city, three-phase current is also being supplied to the municipalities of Brunswick, Coburg, Port Melbourne and Williamstown, also to the city abattoirs, the Melbourne-Brunswick &

THE TOWN HALL OF MELBOURNE, AUSTRALIA

Coburg Trams and the State Cool Stores.

The City Council has discontinued the generation of single-phase current, which is used at present in the outlying portions of the city and in the Footscray municipality. These supplies are taken through suitable transformers connected to the three-phase system. By the substitution of a rotary converting plant, the gradual displacement of the remaining direct-current generators will be effected at no distant date, and the whole of the generation will then be performed by large-capacity, three-phase turbo generators, which in comparison with the smaller plant originally installed are very much cheaper to install and to operate.

The Annual Statement of Accounts for the year ending December 31, 1919, shows an operating expense of £134,854, shillings and pence omitted, against an operating income of £240,081. This makes a net operating revenue for the year of £105,227 in round numbers, which compares with a figure of £108,782 in 1918. Both the operating income and the operating expense increased in 1919 over the figures for 1918, but it will be noted that the net operating revenue for 1919 is some £3,500 less. When interest, depreciation and other charges have been written off against the account, it leaves a net profit for 1919 of £30,491 15s., as compared with the 1918 figure of £35,227 17s. 11d. As wages and other general expenses showed very little change between 1918 and 1919, the biggest single factor in the increased costs was the item for coal, which advanced from £55,000 to £63,000.

This reduction of the margin of profit in utility plants has been universal during the past year, but there are factors which make the Melbourne plant well prepared to meet it. The charge for lighting units has remained practically unchanged since 1912, and for power units since 1911, and both are low. The scale is variable, that for lighting units ranging from 6 pence to 1 penny; and that for power units from 2 pence to ½-penny. It is obvious that these rates could be increased without hardship to consumers, if the city administration should decide that an increase in revenue was desirable.

Making the Most of the Back Yard

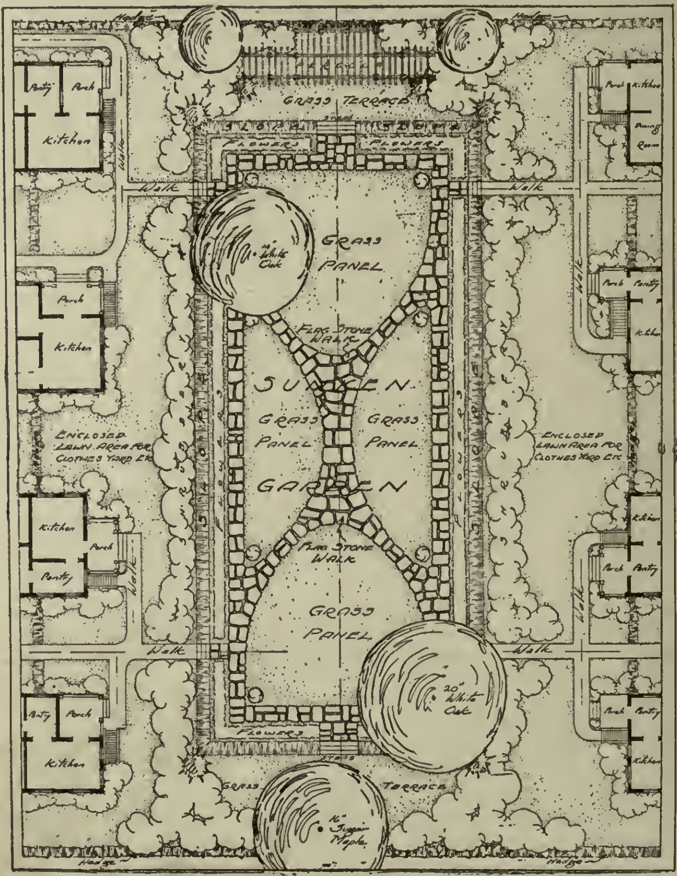
By E. S. Stiles

Landscape Architect, Charlotte, N. C.

IT is usual in the treatment of suburban properties which lie well within the corporate limits of the city proper to divide the individual lot into two main parts, the front yard and the back yard. The long, narrow shape of such lots precludes any great amount of utilization of the side yard areas because the house itself occupies the greater portion of the width of the lots. Hence the usual custom is to treat these lots as a uniform development on the street or front side of the property by giving all houses a uniform setback of from twenty-five to sixty feet from the street, thereby affording a small front yard which cannot well be treated otherwise than by establishing a good lawn, planting a few shrubs around the porch steps, and sometimes adding a low hedge next to the front sidewalk.

This means that this class of suburban property owner must confine whatever development of the home grounds he undertakes to the back yard; and in the majority of cases this too often results in the utilization of this portion of the property as a clothes drying area, a small vegetable garden, and, even worse, a general repository for odds and ends. However, if careful thought is given to the proposition and sufficient attention paid to the community spirit for the pooling of individual lawn areas, much may be done in the way of utilization of this back yard area as a place for private recreation for the owners of the properties adjacent.

This will apply equally well to two houses which back directly upon each other, a group of houses, or even a whole portion of a small block. And indeed, from a community standpoint, these last have a distinct advantage over lots of a larger area, as they are usually too small to admit of vegetable gardens of sufficient size to pay for their construction and maintenance, while the garage problem is usually solved by the owners of these properties keeping their cars in some nearby garage. The proprietor of a suburban home with a greater lawn area is usually obliged to build his



PROPOSED DEVELOPMENT OF A COMMUNITY BACK YARD GARDEN—THE INTERIOR COURT AREA OF A SUBURBAN BLOCK garage upon the property itself, thereby cutting off a considerable portion of the available lot space of the back yard. The owner of the small suburban lot in a closely built up community needs to devote only a small portion of his back yard to the drying of clothes, while the remainder of the yard, not large enough for a garden and consequently in reality often a waste space used as a dumping ground for miscellaneous portions of the family belongings, is frequently unsightly and generally poor in character.

The accompanying illustration shows one possible and entirely practical means of community utilization of this waste area. Experiments of this character have been tried out in several of the larger and more closely built up cities of this country. Such a development affords sufficient space for the drying of laundry and other necessary back-door activities, gives perfect seclusion from the street, and at the same time privacy from the back doors of the houses themselves, by means of the shrubbery border which completely surrounds the garden area and from the fact that this area is depressed slightly below the level of the lots themselves.

A garden of this character will produce sufficient cut flowers for the tables of the neighboring families and has sufficient flowering area to afford a bright and cheerful appearance throughout the entire season. It affords a play space for the children in the morning and afternoon and a sheltered promenade for the older members of the family after work is over in the evening, or an attractive setting for the holding of outdoor afternoon card parties and little informal garden affairs in the evening. The extensive use of the stone path means dry footing even after the hardest rain and also a minimum of attention from the family lawn mower.

Such treatment is simple in character, easy of construction, and with slight modifications adapts itself well to the usual topography of city lots. The cost of flowers, shrubbery, materials for the walk, etc., will total less in the expense column than would the cost of the individual landscape treatment of each lot as a separate unit. The throwing of all waste space into one available community area makes the most out of every inch of the land involved. The plan in its entirety may not be applicable to all city blocks for which it may be used, but it is closely modeled after several developments which have actually been constructed; and in the majority of instances it can be quite closely followed by slight alterations in the shape or extent of the design.

Such utilization of the back-yard area will go a long way toward stimulating a close community interest; it will afford a place of recreation and privacy for young and old, especially in those portions of the city where a public park can be reached only by a long hot walk or a tedious ride in a crowded trolley car after the day's work.

More Motor Trucks for Street Cleaning

The city of New York has awarded a contract to The White Company for furnishing 212 5-ton dumping trucks for use by the Street Cleaning Department. It is the largest single order for motor equipment ever placed by a municipality. The trucks will be used for all phases of street cleaning work, including the removal of ashes, garbage and snow.

Seventy-five of the trucks will be equipped with removable bodies and may be readily converted into flushers and sprinklers by the substitution of 1,200-gallon tanks to replace the dump bodies.

The contract price for the entire order of heavy-duty trucks, including "Studebaker Model" flushing equipment for 75 of the machines, amounts to the sum of $1,422,190.55.

New York City spends millions of dollars annually for street cleaning work, and the action of its officials in providing the Street Cleaning Department with a huge fleet of trucks, it is estimated by the city's engineers, will save the municipality large sums of money each year, and—what is of equal importance—will give the city ample protection against the blocking of thoroughfares by heavy snowfalls. The plan adopted by New York for keeping its streets clean will be watched with interest by cities throughout the country.

The Construction of Public Works

An Outline of Methods of Carrying Work Through Successfully

By James P. Wells
Consulting Engineer, Rochester, N. Y.

EVERY municipal official who has conceived the idea of a public works improvement, has brought the subject to the attention of the citizens and then successfully carried it through to completion, feels, with justice to himself, a great degree of satisfaction. Few of his fellow citizens, however, will realize how difficult his task has been. The starting and the carrying out of a public improvement of any magnitude is often an arduous and annoying task to the particular board or individual in charge of the work. The writer has endeavored to outline in this paper some suggestions based on his own experience in these matters which may be of value to public works officials.

What Improvements are Needed?

First of all there must be the need of the improvement, whether it be a bridge, a new water-supply, a filtration plant, a sewer system or a sewage disposal plant. If the officials realize that the improvement is needed, the very first point to determine is the best way to make it and what it will cost. Often this very matter of finding out what should be done and how much it will cost has required six months, a year or often two years, simply because conflicting opinions and ideas were voiced by different officials and prominent men, none of whom had any technical knowledge whatever. This preliminary delay and period of indecision can always be forestalled if the proper official or officials will immediately obtain the services of a competent engineer, seek his advice and secure cost estimates. In commissioning an engineer to do such work he should be given a free hand. He should not be told to investigate one particular project, but to find out what is the best way of solving the problem. Ordinarily if a man is sick he calls a doctor. He does not tell the doctor what to prescribe, but lets him use his own judgment. Many municipal officials waste months in conjecturing about matters of which they have no technical knowledge, and when they do ask an engineer to pass upon the matter they do not give him a free hand, but indicate to him what kind of report they want him to write, based on their own preconceived ideas.

Publicity Essential

Once the engineer's report is received and the city official has decided upon what action to take, the next step is to let the public know all about the proposed improvement that it is possible to let them know. One of the best ways to do this is to have the engineer's report printed. His report should be devoid of all technical phrases and should state in the clearest possible manner what should be done and why it should be done. The construction of most public works is not a complicated problem and can be readily explained to the average citizen. The editors of the newspapers in the municipality should be made thoroughly acquainted with the details of the proposition.

The method too often employed has been to let both newspapers and public have as little information as possible in regard to the improvement, and then expect the people to vote for it. The writer has had experience with both methods of carrying out public works. Where the citizens of a community have known all the details of the improvement, they have been well satisfied from start to finish. Where the reasons for making an improvement have not been known to the public, there has always been more or less dissatisfaction.

Another very effective means of informing the public as to the merits of a proposed public improvement is by public meetings. The engineer and some of the municipal officials should be present at the meeting and explain the proposition, and if possible use lantern slides to illustrate different phases of it. An opportunity should be given for the citizens to ask questions.

What may appear to be a very simple

matter to those who have not had the experience is that of having the papers prepared for a municipal election where a bond issue is to be voted upon. The correct carrying out of the proceedings in a municipal election to vote on a bond issue is by no means a simple matter, and it is one in which the village or city attorney should use the greatest caution. Many times a technical error in this connection has invalidated the entire bond issue and it has been necessary to hold another election three or four months later, or perhaps a year later, thus entirely upsetting the plans for the improvement, causing the officials a great amount of annoyance, and often costing the community a large amount of money by reason of the delay. There are attorneys who make it their special business to do such work. The fee is comparatively small and it is money well spent to get the advice of specialists in such matters.

Once the funds are available to carry out the improvement, the next step is to decide who shall take charge of the work. This depends largely on the organization which the municipality already has, and upon the character of the work. In most large cities any work of this nature can properly be done under the city engineer, for the large cities can usually afford to employ a man of wide experience. In small cities it may result in a great waste of money if the city engineer is allowed to take charge of the whole public improvement unless he has had special training in that particular line of work. To be sure, it may give him experience, but no municipality can afford to pay for that experience. In small cities the best course to pursue is to put the public improvement directly in charge of an engineer who has had special training and who has made it his business to carry out the construction of similar public works. It will not do simply to get the advice of such an engineer. For the best results he must be given entire charge of the work so that it will be possible to fix the responsibility upon him.

Prosecuting the Work

The first step the engineer will take after he has been engaged will be to make accurate surveys and detailed plans and specifications of the proposed structure or structures. After these have been prepared, the method of carrying out the construction must be decided upon. There are four methods by which public works may be constructed. In some cases there are legal restrictions which prevent a municipality from having a choice of any of the four methods.

The first method is the day-labor plan, by which the city pays directly for the labor and materials. Ordinarily this method of carrying out construction work, especially where the project is of any size, has not been satisfactory. The trouble has been that the city has not an experienced organization to carry out the work, and politics is liable to decrease the efficiency of the force.

The second method is by the cost-plus-percentage contract. In this case the contractor does the work, hires the labor and buys the materials, the city recompenses him and also pays him a certain percentage on the cost of the work. The great trouble with this form of doing the work is that the work is delayed and the cost is increased in order to increase the percentage. It may be argued that if the contractor is honest he will do this. He may not intend to do it, but the men who are working for him will find out that it is a cost-plus-percentage contract and they will think they are doing the boss a good turn by increasing the cost. While there are exceptions, most of the cost-plus-percentage work that has been done has been done extravagantly.

The third method is the cost-plus-a-fixed-fee, by which, as in the second case, the contractor pays for the labor and materials and is recompensed by the city for them, but is paid for his profit a fixed lump sum or fee. With this method there is no incentive to increase the cost, because, as a matter of fact, the profit will be the same. Instead of there being the desire to make the work last, there will be a desire on the part of the contractor to get it done as quickly as possible in order that he may go somewhere else. The shorter the time it takes him to do the work, the less will be his overhead expenses.

The fourth method is by advertising work and receiving competitive bids. After the bids are received, the contract is then awarded to the lowest responsible bidder. The great trouble in letting contracts in this manner is the difficulty in deciding whether the lowest bidder is responsible; that is, whether he has sufficient capital to carry out the work, and whether he will carry the work through to completion regardless of loss if he gets into difficulties. It does not always pay to let the contract to the lowest bidder. Those who have the decision in the matter should let the contract to a bidder whom they know to be competent, who has done work of a similar nature, who has sufficient capital to carry out his work, and whose reputation is such that they can be certain he will carry his contract through to completion regardless of possible loss. With such contracts it is customary for the contractor to give a bond. Sometimes these bonds are of value, and sometimes they are of absolutely no value. If the contractor fails to carry out his contract and the bonding company is asked to go through with it, the situation often arises that the bonding company has found some excuse for not fulfilling its bond, and when the matter is taken to the courts there is a long-drawn-out legal battle which may cost more than the amount of the bond. The best way is to settle such matters out of court if possible.

Of the four methods of doing construction work, the third method, that of a cost-plus-fee basis, is considered by many to be the most satisfactory. If it is not possible for the city to do work in this manner, then the best method is the fourth, that of letting the work on a competitive basis.

Once the contract has been let and the work is under way, it may be largely left in the hands of the engineer in charge, and he will each month render estimates to the city officials which will state the sums the contractor is entitled to for the preceding month. The engineer has a position of considerable authority, as he is in the position of a judge between the municipality and the contractor. It is impossible in a set of specifications to cover every contingency which will arise as the work proceeds. Many engineers have made the great mistake of splitting hairs with contractors. Their requirements have been so rigid that they were beyond all reason. The writer once knew an engineer who spent three days in a creek with his transit trying to set within an eighth of an inch the location of a huge form at the bottom of a dam which was to be 60 feet thick. He never succeeded in getting the form set to this degree of accuracy, but the delay occasioned by his attempt and the trouble to which the contractor had to go in trying to accomplish what the engineer wanted cost the contractor a great amount of money. Naturally, to make up his loss, he slighted the work somewhere else.

Oftentimes it appears, after work has been started, that a change may be made in the class of material, or changes in the plans which may improve the character of the structure or make things easier for the contractor and still accomplish the same result. In such an event the best course for the engineer to pursue is to have the changes made. His position should be one of assisting the contractor rather than that of trying to hamper him in everything that he does. In the carrying out of public works there is considerable opportunity to give and take. The essential duty of the engineer serving the city is, first, to get the work done in as high-grade a manner as possible, and second, to do this with a minimum of friction.

Municipal Forests are Badly Needed

There is approximately three times as much timber cut from the forests of the United States every year as is grown in a year. If we begin at the present time to protect our cut-over lands from fire and use wholly practical forestry methods to insure reproduction after logging, we could secure in the next 50 to 60 years an annual production of over 60,000,000,000 feet of lumber a year without lessening our forest capital, according to a statement of Henry Graves, formerly chief of the United States Forest Service, Department of Agriculture.

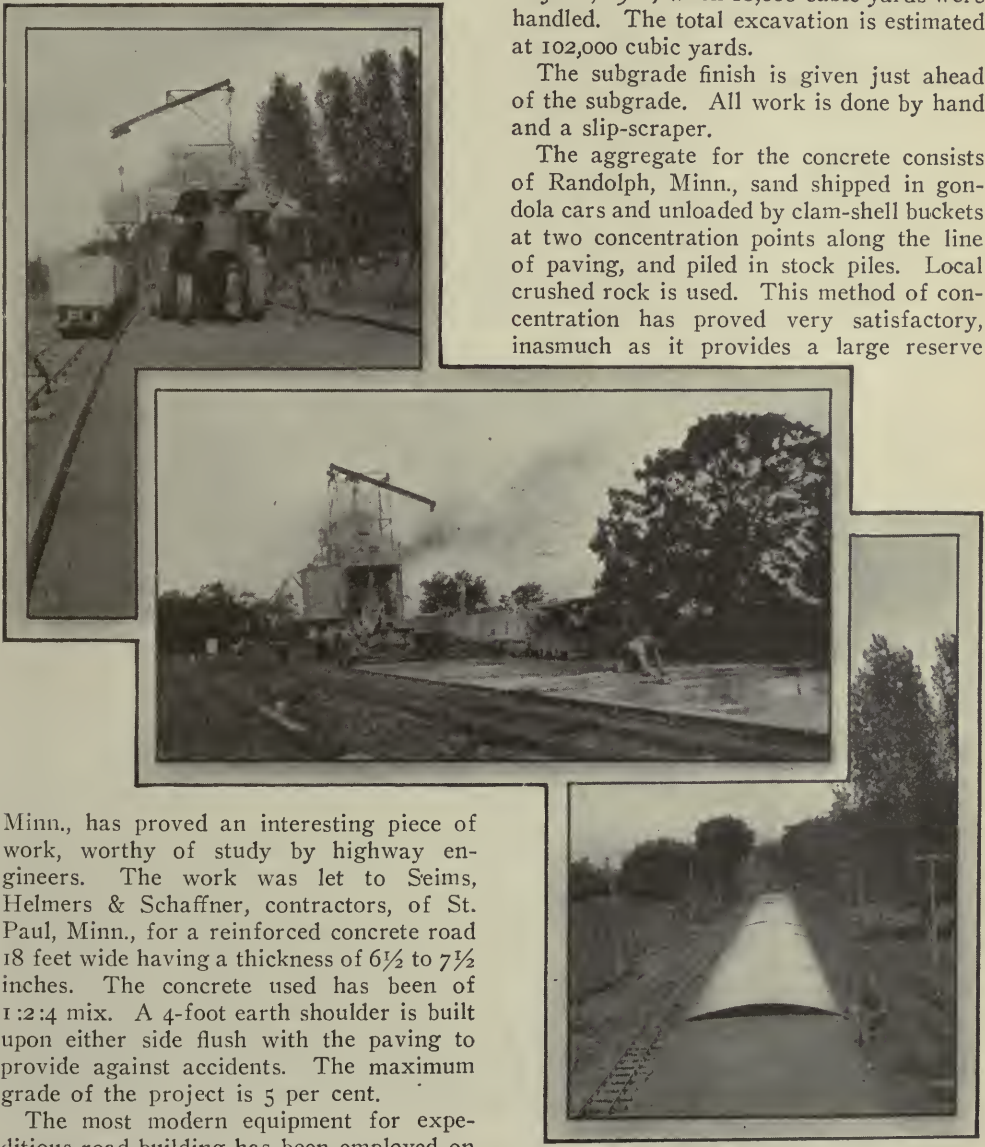
Counties and municipalities can do much to lessen this tremendous loss through the establishment of communal forests and preserves. These forests will mean a comparatively small initial expenditure, and in the course of 25 years will be vast sources of income for the city. Officials with sufficient foresight can thereby look forward to a possible decrease in taxes and to providing money for the retirement of future bonds through a wise present reforestation policy.

Paving the Jefferson Highway in Rice County, Minn.

By P. C. Brown

Assistant Engineer, Rice County, Minn.

THE construction of the portion of the Jefferson Highway between Northfield and Faribault in Rice County, Minn., has proved an interesting piece of work, worthy of study by highway engineers. The work was let to Seims, Helmers & Schaffner, contractors, of St. Paul, Minn., for a reinforced concrete road 18 feet wide having a thickness of 6½ to 7½ inches. The concrete used has been of 1:2:4 mix. A 4-foot earth shoulder is built upon either side flush with the paving to provide against accidents. The maximum grade of the project is 5 per cent.



VIEWS ALONG THE JOB
Upper—Industrial railway serving mixer. Middle—The mechanical tamper and finisher. Bottom—The covers for the completed road.

The most modern equipment for expeditious road building has been employed on this highway. The grading equipment included two elevating graders, one 8-foot blade grader, and fourteen 1½-yard dump wagons. All of the grading equipment has been handled by horses. The monthly maximum for excavation and grading was in June, 1920, when 18,000 cubic yards were handled. The total excavation is estimated at 102,000 cubic yards.

The subgrade finish is given just ahead of the subgrade. All work is done by hand and a slip-scraper.

The aggregate for the concrete consists of Randolph, Minn., sand shipped in gondola cars and unloaded by clam-shell buckets at two concentration points along the line of paving, and piled in stock piles. Local crushed rock is used. This method of concentration has proved very satisfactory, inasmuch as it provides a large reserve supply. Bulk cement was tried out at first but caused too much waste so was abandoned. Material is transported from the concentration point to the mixer by an industrial railway, using two gasoline and two steam locomotives with trains averaging from five to seven cars. Each car carries the aggregate, including cement for one batch, or ¾-cubic yard, of concrete. The cars are loaded from hoppers filled by the clam-shell buckets.

One ¾-yard Lakewood mixer, equipped with a hoist for lifting the batch boxes, furnishes the concrete. This is pulled by a tractor which furnishes the steam to operate the mixer and hoist. The batch boxes are equipped with dump bottoms and are emptied into the hopper which supplies the drum. A one-minute mix has been used throughout. After the concrete is placed, a finishing machine is run over it, tamping and finishing the surface. After this a canvas cover stretched on a frame is placed over the road until the concrete is set. Afterwards the concrete is covered with earth and kept for two weeks.

A force of 95 men is used to handle the unloading apparatus, industrial railway, mixing plant and finishing apparatus. During the month of May, 1920, 15,199 square yards of concrete were placed.

When the first three miles of paving were thrown open to traffic, it was noted that the road was rather rough on the slopes. Careful examination and consideration of the laying of the concrete and consideration of the time element led to the conclusion that this roughness was due to the fact that the wet concrete had bulged up in the rear of the finishing machine. In order to correct this, two finishing machines were put on and more care was taken in placing the forms. The roughness has also been lessened by using a slightly wetter mix on the slopes.

This work is being carried on under the direction of P. L. Hazard, County Engineer, and D. J. Bleifuss, engineer in charge of paving construction for Rice County.

THE ALEXANDER BRIDGE ACROSS THE SEINE, PARIS, FRANCE

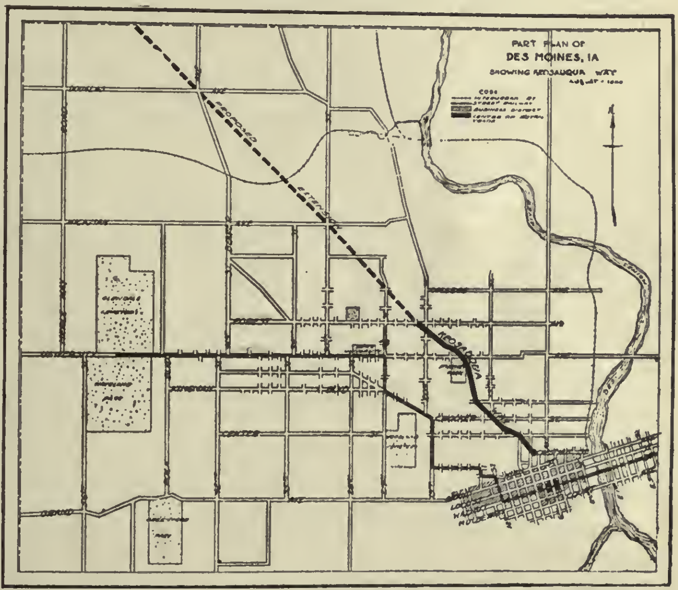
Des Moines' Newest Diagonal Thoroughfare

By Frank E. Wetherell

City Planner

THE northwest section of Des Moines has long been one of the best and most populous residential sections of the city. This section never had a satisfactory thoroughfare leading direct to the main business section. The University Street car line makes no less than eight turns in going from Sixth and Walnut to Twenty-fifth and University Streets, about two miles, and general traffic follows about the same route, zigzagging around the two sides of the squares in order to avoid grades and poor pavements.

There has always been a natural diagonal way of easy grades from the down-town district, running northwest out to about Twentieth and Foster Streets. When one looks the territory over and examines the city map, it is most surprising that this has not been opened up long ago into a thoroughfare, as it intersects the four main east-and-west streets, Center Street, Crocker Street, University Avenue, and Forest Avenue, all of which lead out into this northwest section of Des Moines.



KEOSAUQUA WAY, THE NEW DIAGONAL ARTERY IN DES MOINES, WILL SERVE THE NORTHWEST QUARTER OF THE CITY AND THE FARMING COUNTRY BEYOND

Thirty years ago this was a ravine, generally filled with flood water after a heavy rain, but about that time it was being provided with a large concrete box culvert, now known as Birds' Run sewer. The ravine was then filled up and the adjoining land reclaimed for use. At the time the sewer was built it was proposed to make a street up through the valley which followed the old ravine, and it could have been done for less than $20,000 at that time. But objectors killed the proposition. Dwellings of the poorest kind, generally for colored people, and cheap business buildings, were erected all through this district, until the ravine and sewer were almost forgotten.

But the northwest section was growing rapidly. The inconvenience and increased cost of the poor traffic connection was being felt more and more seriously every year. So in 1916 the Town Planning Committee proposed to the City Council, and the City Council immediately adopted the necessary resolutions for the construction of a thoroughfare 110 feet wide, following this Birds' Run sewer and to be called Keosauqua Way.

Meeting the Objections

The war coming on delayed until 1918 the active steps looking towards actual construction. Hardly had the City Council taken hold of the project vigorously with the intention of seeing it through, when opposition meetings of all kinds were held all

TYPES OF STRUCTURES IN DES MOINES WHICH ARE BEING REMOVED BY THE BUILDING OF KEOSAUQUA WAY

through the district and many protests were filed. The objectors employed the usual fireworks and exaggerated statements regarding excessive cost.

But a carefully prepared estimate and a dummy schedule placing the maximum cost at $607,000, and the maximum cost for each abutting typical residential lot at about $140, together with some statements of increased valuations from similar improvements, brought many objectors to the side of the boosters. The estimates were afterwards verified within a very small margin when the condemnation proceedings had been completed. The values of the properties all through the district have been increased, even before a building had been removed or a yard of grading done, so that the remaining objectors have no arguments left.

To-day the land for the thoroughfare has all been purchased, many buildings have been removed and the right of way is being rapidly filled and graded. By next year we hope to begin paving so that it can soon be opened for public use.

Property Values Increased

Keosauqua Way has demonstrated two things to the Des Moines people: first, that objectors are expensive pests; second, that property values will readily respond to properly planned and rational improvements. Thirty years ago Keosauqua Way could have been built for less than $20,000; to-day it wiil cost $600,000, not counting the paving. During those years millions of dollars have been spent in time and inconvenience by the people going back and forth over the old crooked and roundabout way.

Without exception the abutting properties have more than doubled in value, some of them five times. For instance—and these are actual transactions and the lowest figures are all prices asked or offered within two years prior to the time when the thoroughfare was assured—at Eighth and Park Streets a quarter block 132 x 132 feet was offered at $8,000, later at $14,000. A remnant triangle, 60 x 75 feet off this same quarter-block, has just been leased at a valuation of $15,000. At Ninth and Center Streets, business property has been valued at $50 per front foot for years. Owners are now refusing $200. Near this same property was a four-family brick flat building valued by the owner at $14,000 to $16,000. He was recently offered $42,000.

At Fifth and Chestnut Streets, the downtown end of the thoroughfare, property was appraised at $12,000 in 1914; 20 feet was sold for $13,000, and the owner was offered $44,000 for the balance, but is holding it at $48,000. At Thirteenth and Crocker Streets one lot and two little old houses, offered for years at $1,400, were sold for $7,000, and the new owner now refuses to put any price on the property. And there are many similar cases to prove the same story. Adjacent properties are likewise increasing in values, because of the improvement.

What Educational Methods Can Do in Housing

By Bleecker Marquette

Executive Secretary, Cincinnati Better Housing League

CARELESSNESS and ignorance constitute two of the most difficult obstacles in bringing about better housing conditions. While most American families are intelligent and self-respecting, there is a substantial number of families in every community who have become accustomed to living under conditions of dirt and disorder. They live in our worst houses. Little is done for them and they are capable of doing but little for themselves. In most cases, living all their lives under slum conditions, they have, as it were, imbibed slum concepts and, unaided, they make but little effort to lift themselves above their environment.

This element of our city and rural population receives but little attention and yet it serves as a constant barrier to constructive attempts to improve housing conditions. Ignorant, slothful, sometimes destructive, often in arrears in their rent, these tenants discourage even the progressive, fair-minded owners and real estate men from trying to keep their properties in good condition.

This is in no sense a new view. Housing specialists have known it and stated it for years. The Better Housing League of Cincinnati, a social service organization receiving its funds from the Cincinnati Community Chest, has for two years been making a strenuous effort to find the solution, realizing that until something constructive is done about it, satisfactory progress in housing will be seriously handicapped.

The Visiting Housekeeper Plan

In 1918 the League started a system of educating tenants and of securing the coöperation of property owners through a Visiting Housekeeper. A small section, about fifteen blocks, occupied by colored people, where housing was the worst, was chosen for the experiment. The plan consisted in having the Visiting Housekeeper, an intelligent trained colored woman of mature age, supervise every house in the district, visiting every family and every owner. She soon learned which families needed instruction and which houses needed attention. She then set about gaining the confidence of the families by telling them her purpose to improve the condition of the house and asking their help. She explained to them that owners would not make repairs unless they knew the tenants would take good care of the property, keep their homes clean and orderly and pay their rent promptly. If they would agree to do that she promised to go to the owner and ask him to repair the leaking roof, remove the obstruction from the toilet and paint the rooms. She would go back to the house periodically, note the improvements, if any, and suggest methods of keeping that particular flat a bit more sanitary and orderly—keeping the food covered, washing the bedding, cleaning the floors or any one of a number of things the housewife had never been trained to see.

A simple, attractively illustrated pamphlet called "Home, Health, Happiness," telling in the clearest possible way the tenants' rights and duties, was given to each family where the Visiting Housekeeper felt it would be of help. As soon as she saw progress she would interview the owner, tell him her method of work, assure him of her desire to help him in the supervision of his house, ask that he make repairs she regarded as essential, and promise constant supervision to see that the repairs were appreciated and that his property would not be destroyed. Often her best ally would be the children, who could be encouraged to help the mother with the housekeeping or to take full charge of caring for the yard and who often could be won over when the parents appeared utterly unresponsive.

The Visiting Housekeeper idea did not originate in Cincinnati. It was started in New York in 1914 by the Tenement House Committee and the Tenement House Department. The work was done in New York by three women inspectors of the Tenement House Department. It was limited there to work solely with the tenants and, because the territory to cover was so vast, consisted usually of but one visit to a house. It was discontinued in 1918. The Woman's Municipal League of Lawrence, Mass., in 1917 started work along similar lines in that city, attempting to make the work self-supporting by charging owners a fee for the services. Their Visiting Housekeeper was later turned over to the Health Department. In Cincinnati the plan of charging a fee was tried out for a year, but found to be unsatisfactory for a number of reasons. Unless the fee were very high the Visiting Housekeeper could not supervise enough houses to pay her salary, frequently the very owners whose property most needed supervision were unwilling to pay the fee, the time consumed in trying to collect the fees was too great, and all in all it was found much more satisfactory not to be under the obligation to owners that resulted from their payment of a fee.

Does It Work?

A year of experiment in one of the most difficult sections of the city proved the work to be unquestionably effective. It has now been established permanently as a part of the League's activities. Two more Visiting Housekeepers were added during 1919 and in 1920 two more will be added, one of whom has already begun work. It will be extended as rapidly as possible until enough workers are provided to cover every section of the city where such education is needed.

A careful report has been kept of all work done; a system has been evolved for recording conditions found and improvements made in every house and in every family reached by the Visiting Housekeepers. The following is a table of the results secured by three Visiting Housekeepers from January 1 to December 31, 1919.

1. Improvements in Housing Conditions

Number of housing inspections	2,796
Parts of houses (walls, yards, rooms, etc.) cleaned	952
Parts of houses repaired	537
" " " painted	340
Damp rooms vacated	3
Dark " "	7
Houses torn down	16
Privies torn down	4
Catchbasin toilets abolished	2
New flush toilets installed	16
New sinks installed	53

1. Improvements in Housing Conditions

Gardens planted and flower boxes made.	29
Houses remodeled	6
Miscellaneous improvements	302
Total Defects Remedied	2,267

2. Improvements in Housekeeping

Visits to families	2,362
Housekeeping improved	152
Back rent paid up	115
Removed to better quarters	93
Room overcrowding eliminated	27
Cases of sickness and want discovered and reported for relief	61

3. Cooperating With Owners

Owners endorsing Visiting Housekeeper work	189
Owners requesting Visiting Housekeeper services	64
Caretakers supplied	15

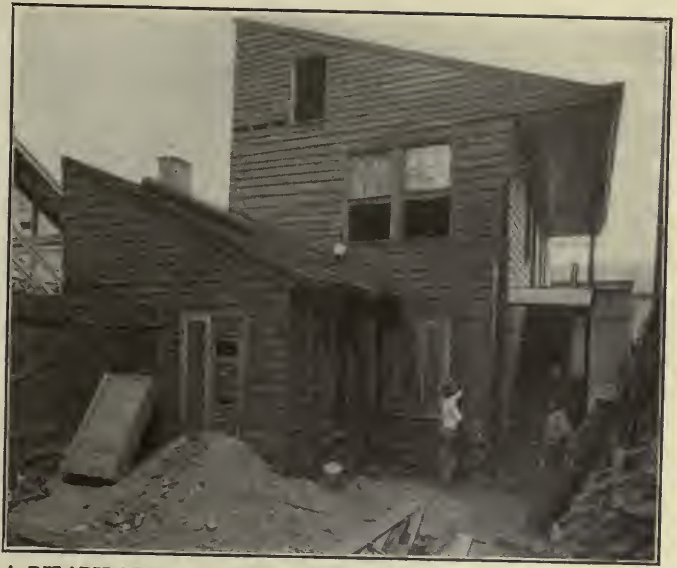
These tables represent 2,267 housing defects remedied by the Visiting Housekeepers by persuasive means through the coöperation of owners and tenants. In addition, some 600 defects, or about 20 per cent of the total of 2,865 defects handled, were improved by city departments—the Housing Bureau of the Building Department and the Sanitary Bureau of the Health Department. Both of these departments are remarkably active and efficient. The coöperation between them and the Better Housing League is practically ideal.

The Human Touch

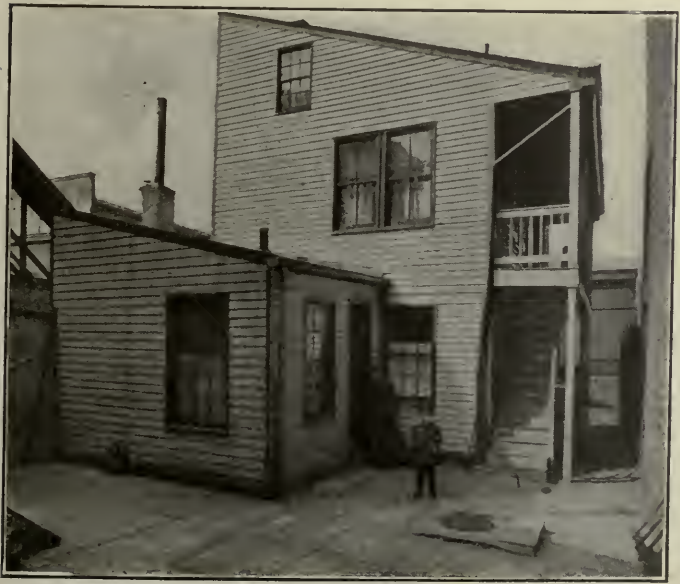
One of the leading housing specialists of the country, speaking in the Housing Course given at the University of Cincinnati last year by the Better Housing League, referred to the interesting results obtained by the Visiting Housekeepers and said that in his opinion the human touch they retain in their work explains its effectiveness. "Put an inspector's badge on a man or woman," he said, "and he immediately bristles like a human hedgehog!"

A Model Flat

The simplest and the most concrete are the things that help in instructing tenants. In order to show families who are unused to cosy, orderly homes how easy it is to make them so, the League established on January first a Housekeeper Center consisting of three typical tenement rooms in the heart of the congested colored district. The flat was no better and no worse than the rest in the neighborhood. The rooms have been furnished simply and inexpensively, using every possible idea to make them comfortable and convenient—the cost of furnishing per room was $50. The flat, in charge of one of the Visiting Housekeepers, is used for classes for mothers and for young girls in housekeeping, in sewing, in rug making, and in cooking. In order to keep the flat open every day a woman lives there, makes garments to be sold to the people in the neighborhood and receives the women who come in to look at the flat. Through the Negro Civic Welfare Committee, a bureau is about to be opened at the flat to supply a pressing need—that of finding homes for colored families. Every family that comes to the flat is visited by the Visiting Housekeeper and advantage taken of the opportunity to encourage improvements in their homes. An excerpt from her report, January 16th to May 24th, will indicate what is being accomplished. "A total of about 400 persons have visited the Center for various purposes. The majority were women. Thirty group meetings have been held. Have given two entertainments, one patching party for the mothers and a membership contest party for the girls. The housekeeping in twelve homes has been decidedly improved, as a result of the activities of the Housekeeping Center. Seven yards are being beautified with grass and flowers. Three vegetable gardens have been planted." The accompanying photographs show one instance of improvements brought about by the Visiting Housekeeper.



A DILAPIDATED HOUSE IN CINCINNATI WHICH THE VISITING HOUSEKEEPER INDUCED THE OWNER TO REPAIR



THE SAME HOUSE AFTER THE REPAIRS WERE COMPLETED

How the Visiting Housekeepers Work with Other Groups

Aside from the chief aim of the Visiting Housekeeping work, namely, educating tenants to take better care of their homes, one of the important results is the reaction of real estate men and owners. Many of them who ordinarily would oppose the efforts of a housing organization have been won over by this plan. It has the special merit of proving to them that the League does not exist for the sole purpose of making life miserable for the owner, but on the contrary fully appreciates the difficulties of the landlord who has to deal with careless and destructive tenants.

Social service agencies find the Visiting Housekeepers a useful ally and constantly refer their most difficult families to the League. The Visiting Housekeepers, on the other hand, find many worthy families never before reached by social service agencies because they are too self-respecting to ask for aid and yet seriously in need of medical or other attention. Incidentally this gives the Visiting Housekeeper an opportunity to befriend such families and to gain their complete confidence.

Another important advantage of this work is that it provides a housing organization with an excellent method of keeping closely in touch with the way city housing regulations are being enforced. In Cincinnati the city departments charged with enforcing the housing laws are so efficient and so coöperative that a check-up is unnecessary.

Reaching the School Children

The present generation will not witness a transformation in the housing of the masses. The next generation may if the children of to-day are shown the vital importance of good homes, are given a sufficiently strong desire to live in decent houses and are taught how to take care of a house. With this in mind, the Better Housing League, in coöperation with the Board of Education, has introduced a method of getting this information to the school children, especially in the schools in the tenement districts. Two years ago illustrated talks were begun in all these schools to the pupils from the fifth to the eighth grade. After these talks the eighth grade pupils study the League's educational pamphlet, "Home, Health, Happiness," and then engage in an essay contest on "What I Have Done to Improve My Home and Neighborhood." A certificate is awarded by the League for the best essay submitted from each school. This work has been made a complete success by the whole-hearted coöperation of the superintendent, the principals, the eighth grade teachers and the Civic and Vocational League (a unique school organization sponsored by a committee from the Chamber of Commerce and the Woman's City Club, the purpose of which is to train the children to an active participation in civic matters). This year a similar plan was introduced in the parochial schools and was very cordially received.

A most encouraging development is the superintendent's plan to introduce into the high schools this year a more thorough-going course of civics than has ever been used before, including some essentials of housing and city planning.

The League's Activities

This educational work is but one of the activities of the Better Housing League. It works with the city departments for better enforcement of the laws, seeking to secure needed increases in their inspection forces and to gain for these departments the strong backing of the public, suggests revisions of the housing regulations when needed, is working with other organizations for a comprehensive city plan and a zoning system, and after a careful study extending over a year is now ready to organize a company to construct homes to meet the increasing demand.

Feature of Coming Municipal Improvements Convention

An interesting feature of the convention of the American Society for Municipal Improvements, in St. Louis, October 12-15, will be the round table discussions of technical matters. The convention is reserving half of the main dining-room of the Planters Hotel, which is to be set up with round tables, in the center of each of which will be a sign designating some particular subject of importance, such as wood block paving, water purification, city lighting, sanitation, etc. The tables will be in use for breakfast and luncheon during all of the four days, and each will be presided over by an expert with a national reputation in a particular line. Visiting delegates may change from table to table during the meeting and join in the discussion of the particular subject scheduled, thus facilitating the exchange of ideas.

The Story Hour as an Activity of the Public Library

By Wendell F. Johnson

Secretary of the Publicity and Efficiency Commission, Toledo, Ohio

THE public library in America has, during the last few years, widened its field of activity until it has come to occupy a very important place among the country's educational institutions. Perhaps one of the least known additions to its field of work has been the weekly story hour, now a recognized part of the public library program in most of the cities of the United States. In Toledo, Ohio, where the almost simultaneous completion of five new branch libraries gave unusual impetus to all library work, a unique opportunity was given to watch the growth of interest in the story hour and to study its results.

For several years the Toledo Public Library had conducted occasional story-hour periods for young children. But they were held at irregular intervals, and the number of children reached was always small. The completion of the five new branch libraries provided a means by which the story hour could be taken into every section of the city and made available to many more children. About the first of 1919 it was made a part of the regular program at each of the libraries. Each Saturday afternoon the librarians at each branch and at the main library narrated to large groups of eager, interested little ones some of the best of the world's child stories.

The results of this program soon became astounding. Interest in the story hour, as measured by attendance, was cumulative from week to week, until the capacity of the libraries was greatly taxed to accommodate the crowds that wanted to hear the stories. As many as 300 children appeared at a single branch on a Saturday afternoon, to attend the story hour. Because the auditoriums in the libraries are small, it became necessary to handle the crowds in three installments, telling the stories of the afternoon to one group after another.

The greatest jump in attendance occurred after a notice had been inserted in the newspapers, announcing the Saturday afternoon program. Illustrating this sudden increase, the attendance at Jermain branch was typical of that throughout the city. On

THE LINE-UP FOR THE STORY HOUR AT THE TOLEDO PUBLIC LIBRARY one day, 40 children attended the story hours at that branch. The following Saturday, after the newspapers had carried an announcement of the story hours, 208 children crowded into the same library. The increase was so great that it was considered more than the libraries could properly handle and little further publicity was given the weekly event. Attendance dropped the following week to 172 and then to 75. Since that time there has been a gradual increase from week to week, as interest spreads among the children of the several communities.

The interest of the newspapers of the city has been secured, and each of them has carried a special feature story on the story hour at one of the branch libraries. Announcement is now made in all the newspapers each week of the stories that will be told on that Saturday. This publicity, together with posters at each of the libraries, has brought out the children in swarms to hear the stories.

To insure the success of the story-hour project, Librarian Herbert Hirshberg made careful preparations. Recognizing the importance of the entire juvenile department of the public library system, he added to the library staff a supervisor of children's work, and brought Miss Ethel Wright to Toledo to fill the position. She is conducting a course for the assistants at the branch libraries in the subject of library service for children. In these classes, held twice each week, much attention has been given to the art and theory of story telling. Miss Josephine Leach, supervisor of teacher training in the public schools, and an expert in story telling, assisted Miss Wright in this work. In consequence, the entire branch library staff received special training in handling the story hour. Special emphasis is placed on the selection of suitable stories and on methods of presentation.

In selecting stories to be told the children, only the best children's literature is used. Stories are taken from the folk-lore of the world, ancient myths and legends, fairy tales, and the great epics. Among the modern stories, Kipling's "Just So" stories, and the Br'er Rabbit tales are favorites. Legendary hero stories have been found to appeal most to boys. The story hour is being conducted on the theory that boys and girls can be interested in good literature by telling them stories of the right type, when such stories would not, perhaps, appeal to them when in book form. Once the boy has heard them told, he will learn to like them, and will lose interest in the Nick Carter type.

An additional attraction offered the children at one of the branch libraries is a victrola which is used at the beginning and the close of the story hour and for relaxation between stories. Records are selected, whenever possible, with reference to the stories to be told on that day. For example, an Indian tale is accompanied by Indian music, and the Uncle Remus stories by negro melodies.

Although the season for the story hour is primarily confined to the cold months, an experiment that has proved successful in Toledo during warmer weather is the holding of the story hour out-of-doors. A vine-covered pergola in the rear of each of the branch libraries has been used for this purpose.

Children from six to twelve years of age are being admitted to the story hour. Recently at the juvenile department of the main library, a separate story hour was started for older children. Eventually the plan is to be adopted in all the libraries. As yet the children are not graded as to age. All are handled together.

The story hour at the libraries has become a permanent institution in Toledo. It is competing successfully with the "movies" as a form of recreation and has taken its place with the public playground and the public school as a means of entertainment and instruction.

Education Versus Compulsion in Health Work

Public sentiment is the one dynamic force of sufficient power to insure necessary compliance with health rules and regulations. Without it health authorities cannot hope to secure adequate health law enforcement, for the average American has a natural tendency to

"* * * flout the law he makes and make the law he flouts."

With it, any law, no matter how drastic, can be effectively enforced for the benefit of the life and health of the many, even though it be to the detriment of the few.

—*New York Health News.*

Forward Steps
Reported to THE AMERICAN CITY *by Municipal Officials & Department Heads*

Finance Departments

Centralized Purchasing Under Commission Government

DALLAS, TEX.—In August, 1919, the Board of Commissioners of Dallas created a Department of City Purchasing. The numerous departments of the city, as is customary under the commission form of government, are organized into divisions, with each Commissioner responsible for his respective division, the divisions, in turn, being divided into numerous departments. In procuring supplies, material and services it is necessary for the head of each department to make his wants known in the form of a request on the Purchasing Department. This particular form is known as our departmental requisition, and it is necessary that each requisition be approved by the Commissioner of the particular division issuing it, before reaching the Purchasing Department. The requisition is then in line for purchase. After a comparison of various prices from different firms, and also a consideration as to quality, the Purchasing Department awards a purchase order.

The vendor supplying the material renders to the Purchasing Department an invoice which is checked against a copy of the original purchase order on file. If it is correct, the files are then cleared and the transaction is closed so far as the Purchasing Department is concerned. The invoice is then forwarded to the department making the original request, to be placed in the proper channel for payment, which involves its being checked to ascertain whether the quantities invoiced were actually received.

Assuming that the invoice is correct, a voucher is drawn by the department receiving the material, with the invoice attached. The voucher bears the Purchasing Agent's order number, and after the voucher reaches the City Auditor's office, preparatory to the drawing of a warrant, the files of the Auditor are cleared as to this particular order, which has been on file in that office since the award of the purchase order to the vendor. This operation prevents a duplicate payment. Should a second invoice appear, all records would show that the invoice was in channel for payment, and it would be caught before starting through a second time.

Invoices leaving the Purchasing Department are stamped with the dates on which they left their respective departments. All payments are made on five- and ten-day discounts. The stamping of the invoices permits a check against departments if for any reason the invoices are not vouchered promptly. Notations as to special discounts are made on all invoices. Careful attention to this detail saves a great many dollars. Almost every line of stock available for prompt delivery being seriously depleted, an effort is made by the Purchasing Department to place purchase orders only with firms having stock ready for immediate delivery.

If proper coöperation is given the Purchasing Department, all departments are benefited, for it takes far less time to prepare a requisition than to have someone from each department constantly shopping here and there. The different departments are not continually disturbed by salesmen during office hours. The Purchasing Agent is in position to card index the salesman and his product, and if such should be needed at a later date he will be called at that time.

It is worthy of mention that coöperation has been received from each firm and that the city now enjoys a purchase power through this centralized office from wholesale firms that heretofore have been indisposed even to quote the city. As they express it, they deal with a single buyer, as is customary in their business. The fact that the representatives of all firms may call at one department instead of being obliged to visit each department of the city, allows them to submit closer figures and facilitates the award of orders. Probably no commercial corporation purchases in a year the varied commodities necessary to operate a city. For example, the first requisition appearing might call for one Ford car; following this a quantity of food supplies might be called for; next in order perhaps a bill of dry goods or medical supplies, or possibly a guinea pig to be used for experimental purposes at the hospitals.

Purchase orders are abstracted to a card record in this office, showing all articles that are purchased and in common need. The card of a certain commodity shows the quantity purchased for a given period by all departments. In view of a central receiving department and stores account, which will permit the buying perhaps of a year's supply and its distribution as needed to various departments, this card record is considered invaluable.

M. M. MURRAY,
City Purchasing Agent.

Police Departments

No Financial Drives Allowed in This City's Streets

St. Louis, Mo.—Like the people of other American cities, the citizens of St. Louis became annoyed by the continued series of hold-ups in broad daylight to which they were subjected by the representatives of more or less deserving organizations, engaged in "drives" to secure funds. The Police Department therefore took steps to protect the city, by issuing the following order:

Commanding Officers:

Now that the war is ended you will see that street solicitations for money are stopped in your district. Workers for legitimate charities will have the right to enter buildings, but they must cease operations upon the streets. This order is especially directed against the practice of placing girls and young women upon the streets to sell buttons, tags and the like. This will not be permitted for any purpose whatsoever.

It has been practically decided that all campaigns to raise funds for foreign relief, perfected after February 1, 1919, will be made jointly and not oftener than once in every three months.

You will understand that this order does not apply to campaigns conducted by the United States Government for the sale of Liberty Bonds, Thrift Stamps and the like.

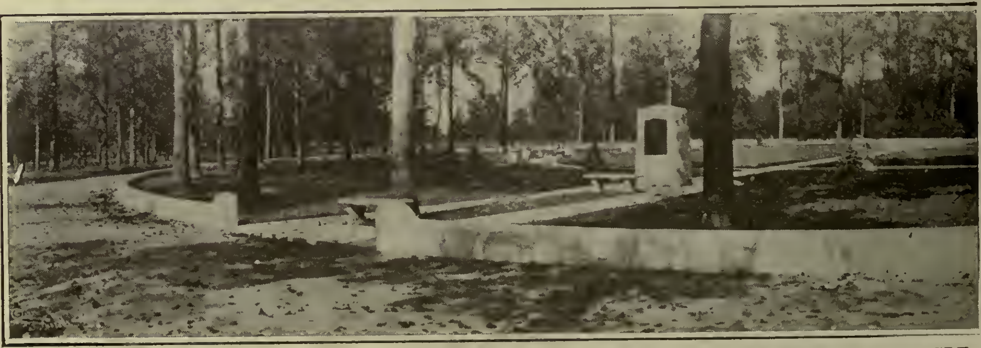
In stopping these drives, the Police Department had the support of the Chamber of Commerce, of other business organizations, and of the citizens in general. The order has been in force for over a year, and is operating satisfactorily.

MARTIN O'BRIEN,
Chief of Police.

City Engineers

A Unique Memorial

Vineland, N. J.—This city has a Soldiers and Sailors Memorial Circle of which it may well be proud.



THE MEMORIAL CIRCLE

More than fifty-six years ago the founder, Charles K. Landis, laid out a plot of ground consisting of about forty acres, with roads leading through this plot north, south, east and west, and planned a circle of trees directly in the center of the intersection of the proposed park, which he later presented to the borough of Vineland. To this day the plot of ground is known as Landis Park.

It was this circle of trees that inspired the people most concerned in a memorial, and after clearing the center of the circular plot of all unnecessary weeds, and wild flowers, the following was the result:

Forty trees reaching to a height of more than fifty feet stand at equal distances in a perfect circle, which in diameter measures two hundred and eighty feet, a cement coping thirty inches high and one foot thick, just about three feet outside the circle of trees, extending around the entire plot. There are twenty-two memorial trees, blue Koster spruce and Douglas firs, alternating, which are set along the inner circular walk which is six hundred feet in circumference, each tree marked by a granite stone, eight feet directly in front, measuring 18 by 14 by 22 inches. A bronze tablet on the beveled top bears the name, age, service, date and place of death of each world war hero. The center flower bed is fifteen feet in diameter, making a beautiful sight when in full bloom. There are about five thousand feet of cement walks, and the dedicatory stone with a wonderful bronze tablet stands eight feet high and weighs eight tons.

The beauty of this park, which may only be appreciated by those fortunate enough to actually be on the grounds, is enhanced by the fact that this is an individual memorial, and a monument with a live growing tree just in the rear of each stone forming a complete circle of trees within a greater circle—a lasting mark of appreciation from the hearts of the Vineland people. The cost of the entire memorial was $5,000 and the finances were raised by the Diamond Social Club, a popular organization of young business and professional men.

CAPT. C. B. ODELL,
City Engineer.

City Planning Commissions

Planning for Decatur's Future

Decatur, Ill.—Decatur's city plan was formally adopted in May, 1920. The next week the City Council awarded the contract for an impounding dam, which will cost, together with land damages and road and bridge changes, nearly $2,000,000.

The two projects will go along together. The impounding proposition had been foreseen, and the fact that the city was to have at its doors a lake six miles in length, considerably altering the landscape and the approaches to the city, was one of the compelling reasons for a comprehensive plan.

The Decatur Association of Commerce appointed a committee of 25 citizens to serve as a City Plan Commission, and one of its first acts, in April, 1919, was to engage the services of the American Park Builders, Chicago, which had been highly recommended by the Planning Commission of Rockford, Ill., where it had just completed a plan.

Decatur has a population of nearly 44,000 by the latest census and grows at the rate of 1,200 a year. Its layout is the conven-

IN VINELAND, N. J.

SITE OF THE PROPOSED DAM AND LAKE IN DECATUR, ILL.

tional gridiron pattern, which has been consistently followed since the city was founded. The plan does not recommend the abandonment of the rectangular street system in its provision for a city of 150,000 inhabitants, but urges that blocks should be 600 feet north-and-south and 300 feet in width, and that alleys in residential sections be eliminated. By substituting long blocks for short ones it is estimated that a saving of $16,864,000 can be effected on the 19 square miles plotted in the plan. The fact has been brought home to real estate men that it is better business to sell land for house lots than to dedicate it for streets, and property owners have been made to realize that short blocks are a wasteful luxury.

Diagonals superimposed upon the rectangular system and giving quick access to the business center from the outskirts are obtained by preserving present country roads and in one or two cases running roads along railroad right of ways.

Five and one-half square miles were plotted in curbed streets, where the topography called for them. Developers of additions in the hilly land and along the lake shores will be encouraged to make streets conform to topography, winding about hills, instead of cutting ruthlessly through in straight lines, which disregard scenic possibilities and cost of grading.

Railroads going through the city at grade in all directions have long constituted a menace to life, and in recent years have caused a heavy economic loss by reason of the halting of traffic. This was one of the most difficult problems for the city planner. It was met in part by the recommendation that two lines, which are bad offenders in blocking crossings, change their direction of approach to the city and come in over the road-bed of another railroad whose tracks can easily be raised for a distance of two miles through the city. Underpass crossings were recommended for other lines, the work to be done gradually. This represents the first comprehensive plan for dealing with the railroad, and it is hoped that the roads can be shown that it is for their advantage to make the changes.

Decatur has at present only 182 acres of parks. The plan recommends the acquirement of 2,500 acres in addition. The valley of Stevens Creek, which flows north of the city and skirts its western outskirts, was found to be admirably adapted for park purposes. A four-mile drive along the creek is urged.

The impounding reservoir, which will be six miles in length and from a fourth of a mile to a mile in width, will furnish another magnificent park reservation if the city acts upon the plan and borders each side with a drive. One of these drives in the plan will be carried along country roads to the north until it meets the Stevens Creek drive.

Illinois has a recent zoning law, upon which the Supreme Court has never passed. The plan strongly recommends that there be some effort to divide the city into industrial, commercial, residential and park zones to the end that there shall be no encroachments of industrial improvements upon residential, and vice versa.

A portion of the city already in use for industries the plan finds admirably adapted to the purpose, and it furnishes a scheme of switch tracks for the use of factories. Centralization of teaming yards, widening of main traffic streets, and a suggestion for a convenient street railway system to replace the present outgrown one, are other things outlined in the plan. A site for a civic center to contain the principal public buildings is recommended.

It is realized that in a state without a town planning act the carrying out of the plan depends largely upon public sentiment. The plan has been well received by the citizens, both in a mass meeting where it was explained, and at an exhibition in the Art Institute. A most gratifying indication is the voluntary announcement by the Plat Committee of the Board of Supervisors that t will not accept for record any plat that does not coincide with the plan.

W. F. HARDY,
Chairman, City Plan Commission.

Park Departments

A Popular Auto Camp

SACRAMENTO, CALIF.—This city maintains tourist rest camp, under the management f its park board. The municipal auto amping ground is situated at McKinley Park, about 17 blocks from the business center. McKinley Park comprises 36 acres, practically all of which is improved, containing a children's playground fully equipped with all modern apparatus, baseball diamonds, soccer fields, tennis courts, open air dancing platform, wading pool, etc. A special part of the park has been set aside for the auto camp. Conveniences for tourists, such as electric lights, showers, sinks, Dutch ovens, and shelter houses containing combination table and benches, are provided. The camp is being maintained as a rest camp for tourists only.

Sacramento was among the first cities to establish auto camps, and additional improvements are made yearly as the popularity of the camp increases. Over 10,000 auto parties registered in 1919.

MRS. M. CARRAGHER,
Secretary, Park Board.

Departments of Education

High School and Municipal Building Combined

BLOOMER, WIS.—On page 386 is reproduced the architect's sketch of the new High School and Municipal Building at Bloomer, Wis. The building is now under process of construction.

Bloomer is a thriving little factory and general business city, situated in a rich agricultural section of Chippewa County. The demand recently arose for a new city

THE AUTO TOURIST'S REST CAMP IN SACRAMENTO, CALIF.

NEW HIGH SCHOOL AND MUNICIPAL BUILDING, BLOOMER, WIS.

hall, and also a new high school. The idea of combining them both under the same roof, which at first thought seems perhaps absurd, has proved to be entirely practicable.

The building is 120 feet long by 100 feet wide, fire-proof throughout. In the basement of the building, 8 feet below the surface and extending 13 feet above grade, is a large community auditorium and gymnasium, equipped with a fine stage, shower baths, locker and dressing rooms. The room is admirably suited for both the above-mentioned purposes.

Because of the location of the building in the exact center of the city, this auditorium will have an ever-increasing usefulness in community life. A part of the sphere of usefulness which is being anticipated will be business and professional men's gymnasium classes, ladies' gymnasium classes, community movies, community sings, community lunches and banquets, as well as supervised play and the general athletic program of the high school. The domestic science rooms and kitchen open immediately off the balcony and are easily accessible to it and to the main floor of the auditorium. Another corner of the basement is occupied by the fire department of the city. This large room opens upon the alley, and its activities will be entirely separate from the remainder of the building. Turning to the first floor, we find one large corner room occupied by the city and school library. The librarian is hired by the school board, and she attends to community as well as school interests. The library is maintained by a library board which secures funds through various public benefits. At the rear of the library the city council rooms are located. The building is so arranged that the locking of two doors separates the municipal interests from the school interests, so that there can be no possible interruption. The remainder of the building is used exclusively for school purposes and is entirely modern in equipment. In the event that the building is ever needed for school purposes alone, the rooms now used by the city can be easily converted into school rooms.

The advantages of a building of this character are many. The one great advantage is a linking of school and community interests much more firmly than in any other way.

LYNN G. HASKIN,
Superintendent of Schools, Bloomer, Wis.

Cleaning a Road for Resurfacing

Experiment Using Compressed Air to Remove Dust from Road Before Resurfacing Proves Highly Successful

THE main driveway leading to Bear Mountain, a part of the Palisades Interstate Park on the Hudson River, New York, was resurfaced during the latter part of 1919 after removing the dust which might have prevented proper bonding of the surfacing and the roadway. This road was built in 1915 on a telford base over which was placed a layer of 1½-inch stone rolled to 2 inches in thickness. Standard Oil binder-B was used at the rate of one gallon per square yard on this layer, following which a second layer of stone of the same size and thickness was spread and rolled and a similar application of binder-B applied. A layer of stone one inch thick was spread on the second layer and thoroughly rolled in at once. The third application of binder-B at the rate of ¾-gallon per square yard was then made and covered with sufficient screenings so that the roller could easily work over it. The surface of this road had become worn down very evenly by the pleasure cars which use it at high speed, by motor trucks and steel-tired wagons and trailers which have been hauled over it with traction engines owned by the Palisades Interstate Park Commission in drawing wood and lumber from the wooded section. The ¾-inch stone showed over the entire surface and was worn.

THE COMPRESSED AIR OUTFIT THAT CLEANED THE PALISADES ROAD BEFORE RESURFACING

For resurfacing, a portable air compressor having a capacity of 40 cubic feet and made by the Chris D. Schramm Company, Philadelphia, Pa., was purchased, and equipped with two hose having nozzles with ⅛-inch apertures. The roadway was first swept by hand and then all the dust was blown from the road surface by this compressed air outfit operated by three men. The outfit covered a half-mile a day and left the road clean as a ballroom floor. A hot seal coat of binder-B was then applied by sprinkling trucks, adhering perfectly.

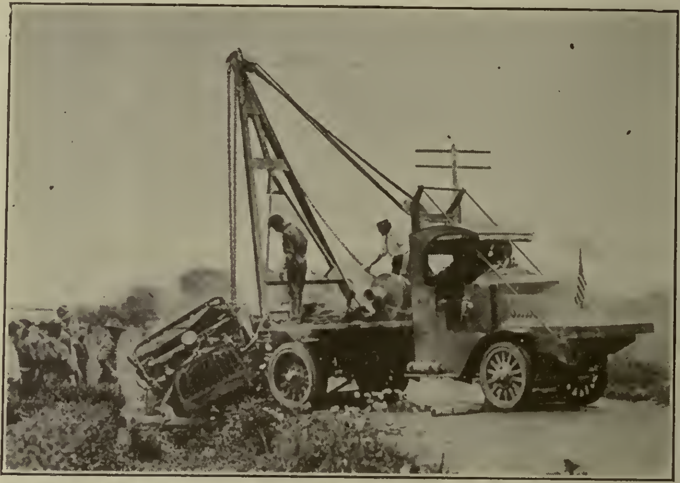
Immediately after the application of the seal coat, a ¼-inch covering of granite screenings was spread over the surface and rolled at once by a 10-ton roller. The binder for the top coat was applied at a temperature of 350 degrees at the rate of ½-gallon per square yard. In spite of the fact that the weather was very hot, the screenings were firmly imbedded in the binder and there was very little bleeding, even after the road was opened for traffic.

Careful examination shows no peeling of the blanket coat put on the roadway, and the whole experiment is a success.

Wrecking-Trucks for Fire Departments

Derrick Trucks Indispensable to Municipalities

THE numerous services which up-to-date fire departments are called upon to render require not only the standard fire department equipment but the apparatus of the rescue squad and other types of emergency equipment. One of the accompanying illustrations shows the emergency truck of the New York Fire Department, which carries complete apparatus for repairs and other work under the benches at the side and a heavy hoist overhead.


AN EMERGENCY TRUCK RESCUING A DAMAGED MOTOR TRUCK FROM THE DITCH

The Fire Department of Boston, Mass., has had a derrick wrecker mounted on a specially built Mack auto truck equipped with a 4-cylinder, 70-horse-power motor, This piece of apparatus has rendered particularly efficient service since it was installed in fire headquarters on Bristol Street about two years ago. The machine can make a speed of 40 to 45 miles an hour and is equipped with a power winch and derrick at the end, which is capable of lifting a weight of 10 tons. Among the ordinary uses to which the derrick can be put are towing in wrecked apparatus, delivering fuel and pulling down walls at fire ruins. It has also been frequently used to rescue horses that have fallen into holes or ditches. The wrecker can pick up a heavy automobile and swing it around as if it were a baby carriage. The machine has a record of several hundred accident cases and now averages almost a dozen calls a week.

AN EMERGENCY TRUCK OF THE NEW YORK FIRE DEPARTMENT

Among the specific instances of the usefulness of the Boston truck are the following: It was used to convey divers and their outfits from the Navy Yard at Charlestown to Fenway Pond, Back Bay District of Boston, the scene of a drowning accident, assisted by Ladder

15. This same machine removed a horse and cart that had fallen over an embankment and into the cellar of a building. The wrecker was used to rescue a horse that had gone through a barn floor on Blue Hill Avenue. It also responded to a fourth alarm from a box on Battery Wharf on the water-front and removed two fire department horses that had fallen into a trench. The wrecker responded to a call from Dorchester, where, assisted by members of Ladder 27, it removed a horse from a manhole, the horse being the property of the City of Boston Sanitary Service.

The above are a few of the outside jobs done by the wrecker and do not include the regular fire department emergency work, which are performed quietly, efficiently and without any special notice being made of it—it's all in the day's work for the wrecker. Boston was the first city to install this type of machine, and since it has been established it has been adopted in a number of other cities. The wrecker was designed by Charles W. Stewart, Supervisor of Motor Apparatus of the Boston Fire Department, and was built by the Mack Company. The wrecker is in reality a traveling repair and machine shop and responds to all third alarms. The motor squad is composed of six men, and three men are kept on night duty.

Borough of Manhattan (New York City) Completes Motorization of Fire Department

In 1910, when the first motor-driven apparatus was installed in Engine House 72, there were 1450 in the entire department. On August 25, 1920, the last five fire horses in service in the New York City Fire Department, Borough of Manhattan, were retired when Engine 47 and its tender were driven out of the station at West 113th Street and were replaced by a new 7-ton combination motor and hose wagon.

The 3-horse engine hitch was first driven out of the fire house, followed by the tender. The engine and tender hitches swung into a cross street with their entire crews. Then the crews jumped out and returned and ran out the new motor apparatus, the two drivers having qualified as fire department chauffeurs after a course at the departmental school for training motor drivers.

TESTING SIX MACK HIGH-PRESSURE HOSE WAGONS AND EIGHT AMERICAN-LA FRANCE 750-GALLON-PER-MINUTE PUMPING ENGINES FOR THE NEW YORK FIRE DEPARTMENT

All this apparatus was tested early in August and immediately accepted and placed in service by the Department

Mixing Devices for Applying Chemical Coagulants to Water

Novel Methods the Result of Recent Experiments at Milwaukee, Wis.

A FEATURE of rapid sand filter plant design which has sometimes received little or no attention, and at others improper treatment, is the manner in which the chemicals are applied to the water to be coagulated. It is believed that the correct method can be developed only when there is a proper understanding of the chemical reactions involved and of the physical phenomena which follow these reactions.

As all chemical reactions of the type utilized in coagulating water are extremely rapid, their velocity increasing with increasing temperature, it becomes a matter merely of bringing together as quickly as possible the reacting compounds. Since the volume of the chemical solution (or solid where dry feeding is used) is very small as compared with the volume of water to be treated, it is apparent that in practice it becomes a mechanical problem of bringing the reacting substances together.

The device which has been widely used to effect this mixing, more especially where softening the water is the object sought, is what is known as a mixing chamber. These chambers usually consist of a series of long, narrow channels sometimes baffled vertically, and sometimes not baffled, but practically depending upon the velocity and length of travel of the water to effect the mixing action.

Types of Mixing Devices

Four different types of experimental apparatus for mixing the coagulating chemical solutions and the raw water were installed in Milwaukee at the testing station. These devices produced rapid and thorough mixing and are believed to be more or less novel and departures from existing practice. That they are simpler and very much less expensive to construct is obvious.

Mixing channels or chamber.—A mixing chamber provided with baffles of "around the end" type occupied nearly the whole of one side of the building. It was 60 feet by 11 feet 9 inches in plan, and contained 22 channels. The channels were each 60 feet long and had a cross-sectional area of approximately 13 inches in depth by 5½ inches in width. The channels were arranged in steps with a total drop from the highest to the lowest channel of 2 feet and 5 inches.

Fish ladder.—In this apparatus a compact mixing device was produced by placing short "around the end" baffles in a narrow but rather tall vertical tank. The height of the tank was 7 feet and its dimensions in plan 1 foot by 3 feet. It contained 17 baffles placed 4 inches apart. The passing space around the end of the horizontal baffle was 4 inches by 1 foot in area. A distance of 6 feet existed between the level of the water entering the device and the usual level in the settling basin.

Fall.—A simple mixing device of another type designated as the "fall" consisted merely of a wooden box 4 feet in plan and 3 feet deep. Near the top and extending the whole width of one side was a receiving tray approximately 10 inches by 10 inches in cross-section. The water is discharged into this tray, together with the coagulant solution, and spilled over the side to an apron set at an angle of about 45 degrees which had two 1-inch high riffle strips extending across the whole width of the apron. The water fell from the apron on a pile of stones in order to still further agitate the flow.

Flume.—A further elaboration of the idea embodied in the "fall" was produced by the construction of a riffled flume. This mixing device consisted of a trough or flume 28 feet long, 2 feet wide and 1 foot deep. It contained thirteen riffles 6 inches high and set 2 feet apart throughout the length of the flume. The flume was set at an angle so that the water had a drop of about 4 feet.

Value of Different Types

The poorest mixing action was obtained with the "fall"; some improvement was effected after changes were made in the manner of introducing the chemical solution, but on the whole its action was rather unsatisfactory. Somewhat better results were obtained with the "fish ladder," but as this device is in reality an "around the end" baffled mixing chamber placed vertically, it offers no particular advantage except in taking up but little space.

It was observed when using the mixing chamber that prompt coagulation—which is, of course, an indication of the completeness of the mixing—took place in the first five or six channels, but that the size of the floc had decreased as the water passed through the lower channels. In some cases the flocculation did not make its appearance until seven or eight channels had been passed, reaching its best condition in the tenth and twelfth channels. The long travel, however, appeared unnecessary and even harmful in breaking up the floc.

In order to see whether reduction in the size of the flocculation particles was due merely to the velocity acquired in the straight channels, or was caused by the agitation of the water as it reversed its direction of flow at the ends of the channels, the latter were blocked about 18.9 feet from the end and new openings cut through the baffle walls. The same number of reversals of the direction of flow was obtained, but the length of travel in each channel was cut down from 60 feet to 18.9 feet. The results were as satisfactory as those previously obtained, but no more so, although nearly 70 per cent of the chamber had been cut out of service.

The "flume" as originally designed consisted of an inclined trough provided with weirs placed 2 feet apart. The water in flowing down the flume formed a series of cascades. An excellent mixing action was produced at a comparatively low velocity of flow. The loss of head, however, was too great. By cutting the "flume" into two parts and attaching the box known as the "fall," the loss of head was cut down about 25 per cent. The results obtained were good and were secured with a low rate of flow. The device takes up little room as compared with a mixing chamber.

In the last device an entirely new principle was utilized. By removing the weirs from the "flume," extending it slightly into the receiving box ("fall") and placing a low weir at the end, there was produced by the rapid flow of the water down the "flume" a "hydraulic jump." By the impact of the water flowing down the "flume" into the pool back of the weir, a turbulent

INTERIOR OF MILWAUKEE WATER EXPERIMENT STATION, SHOWING MIXING DEVICES condition of the water was produced, which effectively mixed the chemical solutions and the water. The chemical solutions were applied at the head of the "flume." The water acquired a velocity of 9 feet a second in flowing down the "flume," but this velocity was practically all dissipated in complex eddies at the "jump." Considerable air is trapped in the "jump," and its escape contributes materially to the turbulent condition of the water and consequently improves the mixing action.

The results with this device have been very satisfactory, and the reason for it requires explanation. When a precipitate is the product of a chemical reaction, it first appears in a very finely divided condition. In the case of a colloidal precipitate such as ferric hydroxide or aluminum hydroxide (the two compounds utilized in water purification), the aggregation of these particles into larger masses is necessary, not only to entrap the fine sediment and minute bacteria in the water, but to prevent them from passing through the sand-bed of the filters. It is obvious that violent and continued agitation of the water will hinder rather than assist in the clotting together of these particles, and hence, to aid this coagulation a quiescent condition is necessary.

The "hydraulic jump" mixing device provides an extremely rapid and thorough mechanical mixing of the chemical solution and the water to be treated, thereby bringing the reacting substances together and hastening the reaction. Immediately following the "jump" the water flows quietly to a settling basin in which the physical action of coagulation can take place with the least possible amount of agitation, and thereby reduces to a minimum the breaking up of the floc during its formation.

The proper mixing of the chemicals with the water, and the chemical and physical conditions resulting, have been discussed in some detail because of its importance in the design of a plant. By the adoption of a simpler design a great deal of money may be saved in the construction costs.

Another factor in the problem of properly coagulating a water of as low average temperature as that of the Milwaukee water-supply, 43° F., has also been given considerable attention. The low temperatures undoubtedly do retard coagulation, and it has even been claimed that for this reason the water supplied to this city would not be properly prepared for filtration. While the floc formed in the coagulated water has at all times been quite small, it has never failed to produce the requisite thickness of colloidal mat on the surface of the sand of the filters.

So far as effective mixing and proper coagulation are concerned, the experiments have proved conclusively that devices can be designed which will effectively handle the water-supply of the city, and that their cost of construction will be much less than some of those now commonly employed.

Artificial Turbidity to Improve Coagulation

On account of the small amount of natural sediment in the lake water, and its low temperature, it was thought that it might be possible to improve coagulation by introducing an artificial turbidity. If the minute particles of a suspended solid formed points around which the colloidal matter could collect, then coagulation might be improved. In consequence, an aluminous clay was obtained which readily disintegrated in water and which was applied to the lake water as it entered the mixing device. The chemical was applied also at the same point in the usual manner. The average turbidity of the lake water was 3 p.p.m. By the addition of the clay the turbidity was raised to 21 p.p.m.

The results obtained were rather unsatisfactory. While it was found that with more suspended particles in the water a larger floc was produced, it did not appear that there was any improvement in the effluents from the filters. It was apparent that the filter sand-bed was being overloaded with clay and that it was not removed by washing, since the effluents of the filters were slightly turbid at the beginning of a run or just after washing. The 21 p.p.m. of turbidity produced had been brought down to 7 p.p.m. in the water applied to the filters, hence it could not be concluded that too great a volume of sediment was passing to the filters.

Another Side to the Billboard

By Tom Nokes

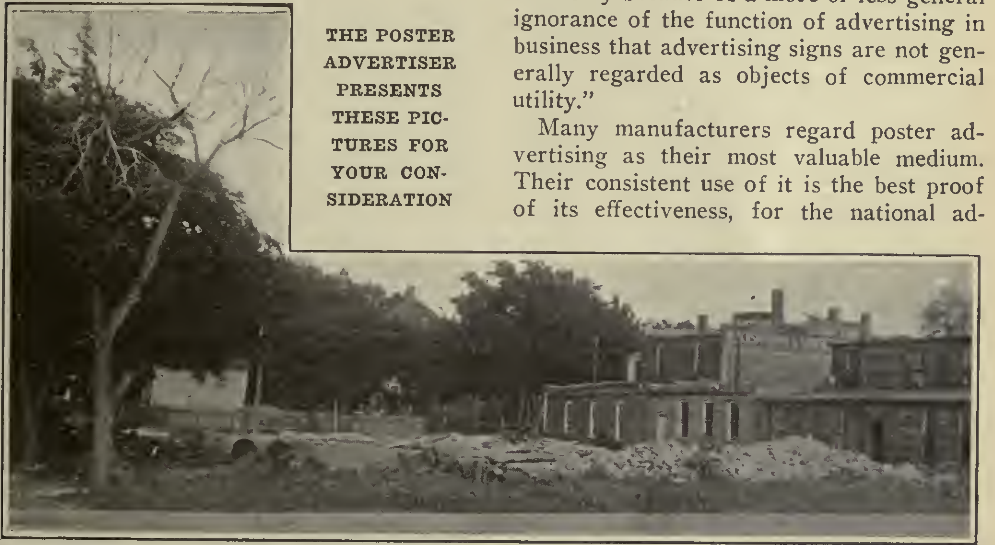
Director, Poster Advertising Association

IT is a common saying that there is some good in every person, and, anent the recent agitation against billboards, provoked by a number of well-meaning people, it might be said that a properly erected and well-placed poster or billboard structure may play a part in the improvement of the appearance of city streets by screening unsightly spots.

A poster board, or billboard, is not the most unsightly thing in the world by any means. In fact, they have even been referred to as "public art galleries." They carry the messages of manufacturers, merchants and others to the world in a most forceful manner.

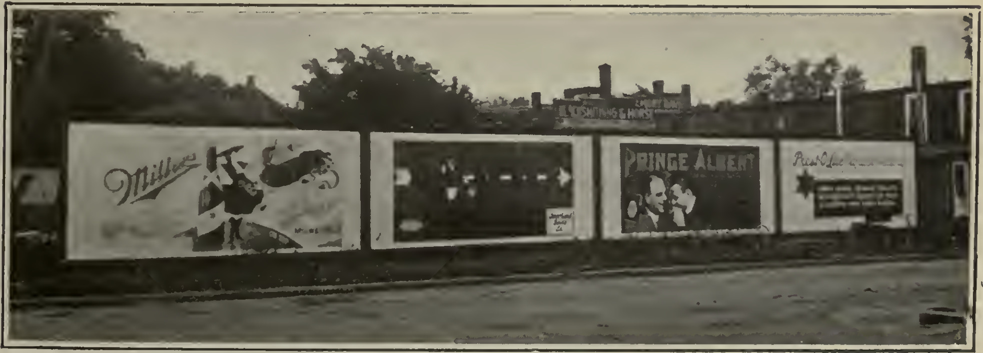
"The outdoor advertising sign," says John Sullivan, Secretary of the Association of National Advertisers, an organization of over 300 manufacturers and others who spend over $250,000,000 a year in advertising to help in the economic distribution of their products, "is an article of commercial utility. Many objects of utility spoil the landscape. But their improvement, rather than their elimination, is sought, because the economic function of objects of utility is pretty well understood and appreciated. It is only because of a more or less general ignorance of the function of advertising in business that advertising signs are not generally regarded as objects of commercial utility."

Many manufacturers regard poster advertising as their most valuable medium. Their consistent use of it is the best proof of its effectiveness, for the national ad-



THE POSTER ADVERTISER PRESENTS THESE PICTURES FOR YOUR CONSIDERATION

A CITY LOT CLUTTERED WITH BUILDING MATERIAL



BILLBOARDS SCREEN THE SAME UNSIGHTLY LOT FROM VIEW vertisers examine and record results very closely and accurately, and never continue to use an ineffectual form of advertising. Therefore there is not much to the claims often made that poster advertising about the thoroughfares of a city is always wasteful, ineffective, and in bad taste. The poster appeals to the masses and classes. People cannot ignore it. Its message burns into the mind.

There is a remarkable number of citizens in any community who will absolutely neglect the improvement of their properties, especially vacant lots. A lot can be covered with weeds, old lumber piles, débris of all kinds, and even old tumble-down buildings, but the city authorities cannot or do not exercise their powers to remedy the condition and appearance. How much better for the appearance of the street or property to have it bounded by a properly-erected and well-located poster structure. Recently in Emporia, Kan., the city authorities asked for the removal of a so-called billboard facing the city scales. Within a week the Mayor asked for the replacing of the board, "as it would help the looks of the entire block."

A mayor of Tallahassee, Fla., in speaking of the refusal of the municipal authorities of that city to join in an anti-billboard campaign, said: "I can readily understand that under some circumstances the billboards may become a nuisance and objectionable, just like many other things in this world. But, so long as the plant owner in Tallahassee pursues his past and present policy of making his boards attractive, and placing them at such places that they conceal unsightly scenes and thus contribute to the exterior beauty of our little city, I predict that it will take nothing short of another World War to change sentiment locally and start any agitation that might cause him embarrassment. He has made so many ugly places more beautiful with his neat boards that I am confident that a large majority of our people feel under obligation to him for this service."

Further, the billboard interests claim that they have as much legal right along city streets as garages, factories, and other structures. Therefore, because some one takes exception to a billboard for esthetic reasons alone, it does not necessarily follow that the billboard is outlawed. If there is anything in connection with the billboard that concerns the comfort, safety, health, morals and material welfare of the community, the police powers may be invoked by the municipal authorities. Nuisances and other wrongs are not committed behind a structure because that structure happens to be used for advertising purposes. The fact is that they are committed behind structures used for all purposes.

In passing on the validity of a St. Louis billboard ordinance the Court has stated that he did not believe that structures used for advertising purposes were responsible for nuisances and wrongs which might be committed behind them.

It is recognized that poster advertising boards should not intrude upon natural scenic beauty spots. Nor are they in good taste when placed in sections of a city devoted exclusively to high class residences. Public buildings, civic centers, schools, churches, parks and boulevards, constructed at great expense for civic beauty, educational and religious purposes, should be respected, and, as far as possible, posting structures should not be located so as to intrude themselves upon the surroundings of such places. Therefore municipal authorities and citizens in general can aid materially in bringing about improvements in billboard excesses, or cases where there is a question as to the judgment used in the locating of boards, if they will only bring such instances to the attention of the progressive men connected with the poster advertising interests in this country.

Editorial Note.—So much space has been given in The American City to material in opposition to the billboard that it is deemed only fair to allow the Poster Advertising Association to present its argument.

CONSTRUCTION PICTURES AND VIEW OF COMPLETED BRIDGE, CATOMA CREEK, MONTGOMERY COUNTY, ALA.

Reinforced Concrete Highway Bridge Replaces Wooden Trestle

The Longest Concrete Highway Bridge in the State of Alabama is in Montgomery County

By Maynard Farrow
Assistant County Engineer, Montgomery County, Ala.

THE Board of Revenue of Montgomery County, Alabama, is eliminating its many wooden bridges as rapidly as is practical and replacing them with more durable and lasting structures of concrete and steel. That every effort is being put forth in accordance with this program is evidenced by the fact that in addition to the regular concrete outfits maintained and operated by this county, state and government aid in accordance with the Federal Road Act has been enlisted in the construction of the more expensive structures.

Federal Aid Project No. 34, Montgomery County's first application for government aid, was the construction of a reinforced concrete bridge over Catoma Creek on the Norman Bridge Road, five miles south of the city of Montgomery, Alabama. The old wooden pile trestle with 16-foot roadway and 1,292 feet in length, which the concrete bridge now replaces, was most expensive to maintain with the heavy traffic which passed over it. It was strong enough to support a 10-ton road roller and its long span was made up of a light 90-foot steel Pratt high truss pin-connected span over the creek proper with 60 20-foot wooden pile bent panels as approaches. The south trestle approach carried a 10-degree curve with 50-foot tangent about midway between the end bent and the steel span. In the selection of the site for the new bridge, the projection of the centers of end bents of the old structure was used as center of new bridge, thereby eliminating the curve of the old bridge. By examination of the low flat black lands which form the drainage basin of Catoma Creek and observation of existing high water elevations, as a factor of safety at flood stage, the clear water way was increased 1 foot in height. This was accomplished by slow, easy approach grades to the main span and a 60-foot vertical curve at their intersection over the arch span. The geological formation of the foundation was found to be sand, clay and loam over tough blue marl, with the sand predominating at depths of 10 feet and over.

On the south approach where the nature of the sand was such as to seem uncertain the footings were pile-driven as an additional precaution.

Bids were invited from bridge contractors on one or all four alternate types of construction, viz: (1) spans cast in place on concrete piles; (2) spans cast in place on bents cast in place; (3) spans pre-cast on concrete piles, and (4) spans pre-cast on cast in place bents.

Six contractors submitted bids on the project; two of whom bid on two alternatives, 1 and 2; one on alternative 4; the other two on alternative 2, only. Proposals ranged from $75,967.70 to $114,046.85. The lowest and best bid was on alternative 2 in amount of $75,967.70 submitted by J. A. Peterson of West Point, Indiana, to whom the contract was awarded. The entire cost of the bridge is borne jointly by the county, state and the Federal Government.

The plans call for a reinforced concrete girder bridge whose total length is 1,288 feet, and a clear roadway of 20 feet, paved with a 2-inch coat of bituminous concrete. The total length is made up as 51 22-foot panels; 2 21-foot panels and 2 32-foot panels joining the 60-foot arch span over the creek proper. The crown of the arch is 30 feet above mean low water level and has a 3-foot rise above the springing line.

The bridge is designed for a uniform live load of 80 pounds per square foot or a concentrated load of 2 15-ton trucks, allowing for impact of 30 per cent of the live load. The design is based on the following unit stresses: steel, tension 16,000 pounds per square inch, compression 15 times the concrete stress; concrete compression 650 pounds per square inch, shear 110 pounds per square inch for reinforced concrete. It is assumed that the steel will carry all tension.

Minimum penetration for piles is 15 feet. All reinforcement is steel deformed bars. Conforming specifications of A. S. T. M. for structural steel. No square twisted bars were used as reinforcement. All concrete in pier footings, pier shafts, and column bases and pedestals is of 1:2½:5 mix; all other parts of the structure are of 1:2:4 mix. All exposed edges are chamfered ¾-inch from each edge. For the railing ¾-inch stone is the maximum coarse aggregate; for all other parts of the superstructure 1½-inch stone is the maximum, with 2½-inch stone as the maximum for 1:2½:5 concrete.

The principal items shown in the contract are:

2,126 cubic yards of 1-2-4 concrete in superstructure;
215.93 cubic yards of 1-2½-5 concrete in footings and pedestals;
703.65 linear feet of columns;
2,862 square yards of bituminous concrete pavement;
60 cubic yards of slope walls;
351,000 pounds of steel deformed bars;
and as force account on basis of cost-plus-10 per cent, 1,600 linear feet of piles were driven in footings.

There is very little current probable so that the embankment at the end bents were rip-rapped with one-man stone not less than 3 inches thick nor containing more than 0.3 of a cubic foot in volume.

Work was commenced on July 7, 1919, and completed and accepted on July 24, 1920. The weather was favorable to construction with exception of the months of November, December and January. During these three months continued daily rains with delays in the delivery of materials tied the contractor up for more than half the time. Extreme freezing weather was of such short duration that no appreciable delay was caused by it. Shipments of materials on 200- to 300-mile haul by rail required weeks for delivery; such delays railroad authorities attributed to lack of transportation equipment. Labor though scarce could be had at $2 to $3 per day and even with the state of unrest, the work suffered no delays on account of shortage of labor.

State highway officials in accepting the bridge stated that it is the longest concrete highway bridge in Alabama. The Board of Revenue has by resolution proclaimed this bridge a memorial bridge dedicated in honor of those who made the supreme sacrifice in the great conflict for the sake of humanity. Suitable bronze tablets have been placed on the bridge carrying the honor roll of Montgomery County's fallen heroes and at an early date public dedication exercises are to be held for the purpose of unveiling the memorial tablets. The personnel connected with the construction of this bridge is: J. A. Peterson, Contractor; J. T. Bullen, District Engineer, U. S. Bureau of Public Roads; W. S. Keller, State Highway Engineer of Alabama; Thos. H. Edwards, County Engineer of Montgomery County, Alabama, and the writer as Assistant County Engineer.

> Timber from insect- or fire-killed trees is just as good for any structural purpose as that from live trees of similar quality, providing the wood has not been subsequently injured by decay or insects. Market dead trees before they suffer injury.
>
> —*New York State College of Forestry.*

The Summer School of Community Leadership

Distinctive Features of the 1920 Session Held at Madison, Wis., by the American City Bureau

THE 260 students enrolled this year for the sixth annual esssion of the Summer School of Community Leadership were recruited largely from the ranks of men and women who are putting to the test of practice the thought that the modern civic-commercial organization, based on the ideal of coöperative effort for the common good, is the logical agency to shape a community's advance. The students were secretaries of chambers of commerce and others interested in community leadership from every corner of the United States and from five Canadian provinces. There were also in attendance at the school 90 members of the American City Bureau's staff, making a total attendance, with speakers and guests, of about 400.

From a humble beginning six years ago in East Dorset, Vt., where there gathered hardly more than a dozen for its initial sessions, the school had grown this year to the dignity of an international institution. The American City Bureau was especially fortunate in being able to secure this year, through the courtesy of the Board of Regents of the University of Wisconsin, the facilities for an ideal summer school.

After months of preparation made necessary by the record-breaking attendance anticipated for this year's session, nearly a hundred members of the Bureau's field and office staff gathered at Madison on August 10. A week of conferences and attention to last-minute details preceded the opening of the school.

To cover in detail the sessions of the school would require at least one issue of this magazine. Every day there were speakers of national reputation presenting the study and thought of years on some phase of community development. City planning; the elusive elements that make up a city's personality; industrial development; health and sanitation; industrial unrest; the farmer problem; community markets; and the relation of a chamber of commerce to the city officials were but a few of the topics presented and discussed.

"We have succeeded in lengthening the average term of life for the human being," said Dr. George E. Vincent, President of the Rockefeller Foundation, "but we have much yet to do in prolonging the average individual's period of good health. We do not die, perhaps; but do we live?" Emphasizing that the health of the citizen is fundamental in the life of a city, Dr. Vincent pointed the way for chambers of commerce in coöperating with health authorities and uniting the activities of public and private agencies.

"Public health is more than a matter of curing existing evils," he continued. "It must deal with the control of environment. This has to do with such things as pure water-supply, pure milk-supply, proper housing, proper recreation for young and old, the control of contagious disease and other things. The mechanism must start with a full-time public health officer, a man competent for his task. He must have adequate assistance. The health activities must be centered in the general organization, well supported by funds, the officer vested with authority to exercise full supervision of the work."

The futility of seeking industrial development through ill-advised publicity campaigns was well explained by C. R. Hebble, Executive Secretary of the Cincinnati Chamber of Commerce, in his address to one of the forum meetings.

"I do not mean to discount the idea of industrial development," said Mr. Hebble, "but I want to urge the importance of making a community ready for such development before it is attempted. There should be no careless use of statistics, and the small community, particularly, should think twice before deciding upon an industrial campaign."

E. B. Hall, manager of the bond division of the Harris Trust and Savings Bank, of Chicago, who appeared with Mr. Hebble in the symposium on industrial development, described the manner in which investment bankers secure and distribute bonds, and

THE STUDENTS AND STAFF OF THE 1920

gave much interesting information on the financing of railroads.

"Giving financial backing to new enterprises is ticklish business," said Mr. Hall, "particularly on the part of the investment bankers with headquarters in other cities. When it comes to the financing of a new enterprise, I believe that local men should be approached. Chambers of commerce should always be wary of participating in the financing of such deals. I would particularly caution them against selling bonds."

One of the most notable expressions of opinion voiced during the session was contained in the message of welcome received by the school from Governor Emanuel L. Philipp, of Wisconsin. Governor Philipp definitely advocated the city manager form of government, and business administrations for municipalities.

The two leading candidates in the Presidential race wired messages to the school congratulating it on its scope and purpose. Governor Cox telegraphed his opinion that "organized efforts have brought remarkable achievement in the management of civic affairs" and "to this end nothing can be more helpful than interchange of ideas."

Senator Harding expressed his appreciation of the school's "most praiseworthy and laudable undertakings" and commented on the "forward-looking activities which have received the practical impetus revealed by the enthusiastic and record-breaking attendance."

The study group plan, which was begun at the 1919 session of the school, was brought to a state of very satisfactory development this year. Grouped in small classes, the students were brought into personal contact with all the members of the faculty.

The success of the study group plan rested largely in the completeness of the text-book series provided for the students. Manuals were prepared on eighteen important phases of civic-commercial organization work. They covered a large section of the teachable technique of chamber of commerce management, and were speedily recognized by the students as considerable additions to their working equipment for their jobs back home.

The subjects covered by the manuals were as follows:

Program of Work
Committee Organization
Committee Management
Members' Forum
Constitution and By-Laws
Newspaper Publicity
Forms
Filing
An Accounting System
Simplified Bookkeeping
Relation of the Secretary to the Board of Directors
Headquarters
Delinquent Members
Reports and Bulletins
Procedure in City Planning
Referenda
Allowable Expenditures
Community Advertising

In most cases the teacher of a particular subject was the one who had prepared the manual from which it was taught. Most of the students had read their manuals in ad-

SUMMER SCHOOL OF COMMUNITY LEADERSHIP

vance, and as a result the instructors were able to pass quickly from the elementary phases of their subjects to the more interesting presentation of experience and practice.

Optional study classes in subjects of special interest to the advanced students were a notable feature of this year's session. In addition to fourteen required study groups, each student was invited to enroll in any ten of the following courses:

Office Forms for Chambers of Commerce
Members' Forum
Filing Systems for Chambers of Commerce
Accounting Systems for Chambers of Commerce
Writing Effective Letters
Vocational Education
Service to, and by, Retailers
Traffic Bureaus
Conventions
Organized Leisure-Time Activities
Equalization of Assessments for Taxation
Promoting a New Hotel
Control of Stock-Selling Schemes
Methods of Procuring Passage of Laws and Ordinances
Municipal Budget Making
Charity Federations and Charities Endorsement
Municipal Milk Distribution
Work for Women Members
Park Development
Subject Matter in Public Speaking
The First Year of a New Chamber of Commerce
Special Problems of Canadian Secretaries
Highway Making and Maintenance
Junior Chamber of Commerce
Proportional Representation

In this year's class there were many students whose knowledge of their profession had been broadened by former sessions of the Summer School and by experience as civic-commercial organization secretaries. To these advanced students the optional courses were of particular value.

In spite of the intensive character of the school methods made necessary by the short term of the course, recreation was emphasized in the program for every day. Since all the students were housed within a stone's throw of Lake Mendota, they found exceptional facilities for aquatic sports. Canoes and bathing suits were much in evidence every afternoon and evening.

The recreational program also included competitive field sports.

The adoption of the Code of Ethics for the Chamber of Commerce Secretary (see following page) was followed by inspiring addresses by Champe S. Andrews, a manufacturer of Chattanooga, Tenn., on "Life Interpreted in Terms of Business," and Dr. Howard P. Whidden, President of Brandon College and a Member of Parliament from Manitoba, on "The Place of the United States and Canada in the Family of English-Speaking Nations."

The annual election of the Students' Association of the Summer School resulted as follows:

F. F. Eubank, Sandusky, Ohio, President.

Rawley W. Holcombe, Hutchinson, Kans., Vice-President.

C. W. Otto, Pontiac, Mich., Secretary and Treasurer.

Directors: the officers, and W. A. Searle, Camden, N. J.; H. A. Davidson, Erie, Pa.; Miss Grace A. Lay, Tampa, Fla.; W. R. Jackson, Harrisburg, Pa.

A CODE OF ETHICS
FOR THE
CHAMBER OF COMMERCE SECRETARY

Adopted by the students at the 1920 session of the Summer School of Community Leadership, conducted by the American City Bureau

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Community Leadership is a Profession

I BELIEVE

That it offers an exceptional opportunity for constructive and substantial community service.

That as a member of this profession I should strive to improve my knowledge, widen my mental and spiritual horizon, and arrive at an understanding of the forces which move men to united action for the public weal.

That I should be at all times sincere, considerate, unprejudiced and fearless.

That my morals should be above reproach.

That I should apply myself to my work with a diligence and industry consistent with my physical and social efficiency.

That I should scrupulously administer the finances and affairs of my office in accordance with the best business practice.

That I should be honest and accurate in the dissemination of information regarding the community which I represent.

That I should hold in strictest confidence all information given in the same spirit.

That I should take no advantage for personal gain of private information received through the activities of the organization which I serve.

That a greater field for service rather than a higher salary should be the actuating motive in any future advancement in my profession.

That I should make no tender of my services to another community unless certain that the position desired is to be vacated.

That I should not accept a salary greater than commercial organization experience shows my organization is justified in paying.

That I should accept no renumeration for my services as a commercial organization executive apart from the regular salary for the position, except with the full approval of the Board of Directors.

That I should refrain from attempting to increase my salary by playing one organization against another.

That to make a change of position after only a few months of service or while in the midst of important incompleted activities is wrong in principle and detrimental to the profession.

That the ethics of my profession are best served by giving credit for accomplishments to the organization, rather than to the secretary.

That I should have the courage to admit my mistakes and thereon build for future success.

That I should so conduct myself and the affairs of my organization that others in the profession may find it wise and profitable to follow my example.

That I should be willing at all times, when requested, to assist my fellow secretaries in the solution of their problems and in securing a better understanding of the principles of the profession.

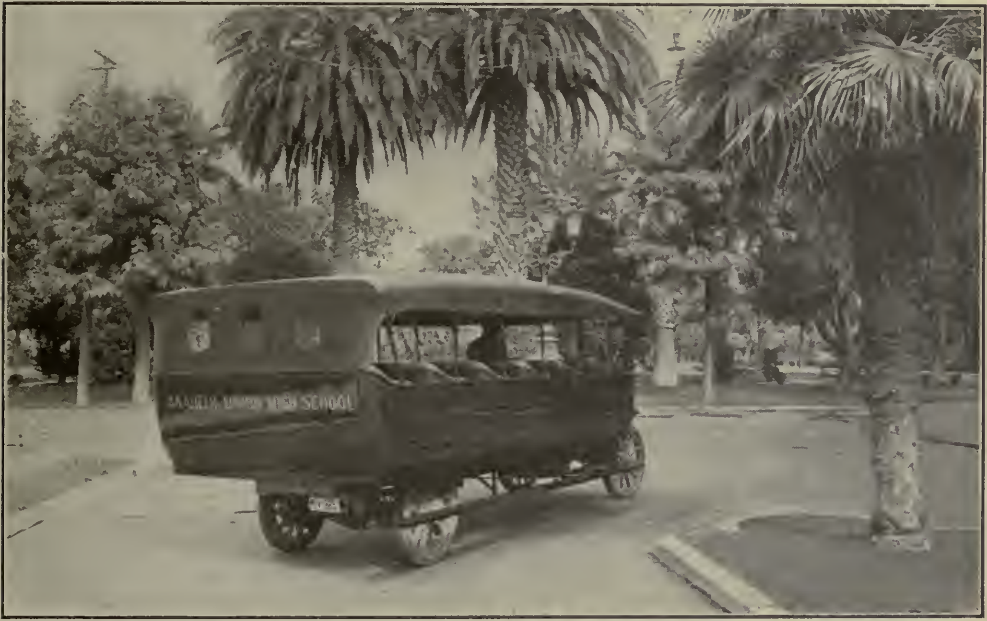
That my acceptance of a position as secretary should be founded upon implicit faith in my community, in my organization, in my profession and in myself.

That above all I should be loyal to my community and to my organization.

That I should exemplify the principles of unselfish community idealism and urge the responsibility and privilege of community service.

Modern Methods Mean the End of the Little Red Schoolhouse

THE question of better educational institutions in the country is coming more and more into public view. The alarming trend of enterprising young people from the country toward the cities, with its resulting harm to the entire country, is constantly under discussion, and solution after solution has been put forth—on paper. A practical correction of this problem must be found, and found quickly. Now the Government has taken a hand, and is working for the development of centralized educational institutions in the country, which will do much to make farm life more attractive to worth-while young people.



ONE OF A FLEET OF TRUCKS WHICH ARE USED TO CARRY RURAL SCHOOL CHILDREN TO AND FROM THE UNION HIGH SCHOOL OF ANAHEIM, CALIF.

California is noted for its fine roads, and this gave the key to the solution. A 1-ton Federal was purchased for the El Cajon School, with a special bus body. This body has one door, with seats arranged crosswise, and end seats which fold up to leave a passageway. Thirty-one passengers can be comfortably seated.

Naturally, the services of this truck are required but twice a day—to take the students to school and bring them home. It makes two trips, each 8 miles, traveling but 16 miles per day. As the school is open but five days, the average per week is 80 miles. Records show that this truck actually consumed but 5 quarts of gasoline per day, 6¼ gallons per week, making 12.7 miles per gallon.

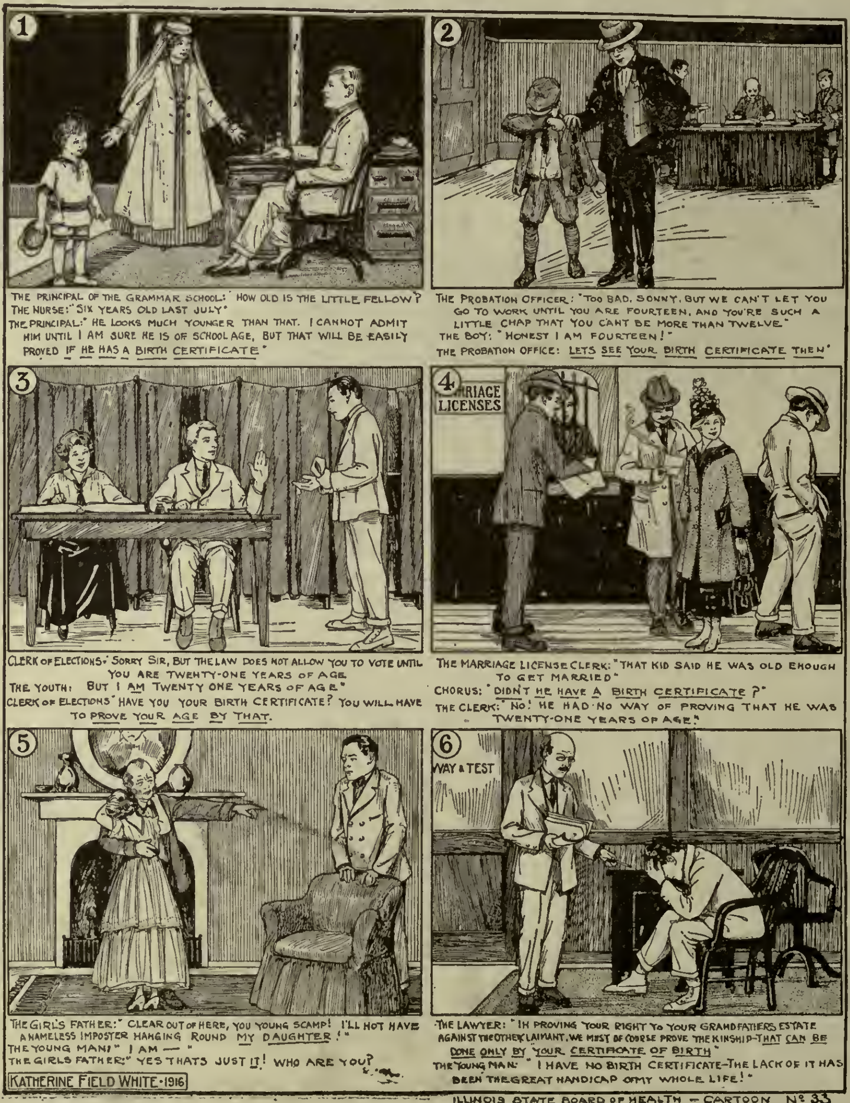
The Anaheim Union School, which covers a somewhat larger territory, is operating a fleet of several trucks with much the same body construction.

The same plan in various forms is in operation not only in many districts in California, but in widely scattered places throughout the United States. The plan varies in different localities. Some school boards are using adaptable truck bodies which do other work on contract during that part of the day when they are not occupied with their school trips and on Saturdays. Other lines are operated by farmers' coöperative trucking companies, which merely handle the transportation of the pupils at a fixed rate per pupil or per family, as a part of their regular business. In still other places, the work is handled by some farmer who owns a truck and who increases his revenue and cuts the idle time of his equipment by taking to school the children of other farmers in his neighborhood at the same time that he takes his own, charging a small fare for each trip.

Wherever in operation, the plan produces not only the result of bringing higher educational facilities right to the farmer's front door, but another benefit which is not so obvious at first glance. Not only is the general health of the children improved by reason of escaping the evils of walking to school through all kinds of weather—and walks of three to four miles to country schools are not uncommon—but as a natural consequence the ability to get the most out of the lessons is increased. The children arrive at school fresh and free from fatigue, and naturally are in much better condition to concentrate on the duties which await them in the classroom.

The Child's Birthright--A Birth Certificate

Is Your City Protecting Its Children by Requiring Birth Registration?


1
THE PRINCIPAL OF THE GRAMMAR SCHOOL: "HOW OLD IS THE LITTLE FELLOW?
THE NURSE: "SIX YEARS OLD LAST JULY"
THE PRINCIPAL: "HE LOOKS MUCH YOUNGER THAN THAT. I CANNOT ADMIT HIM UNTIL I AM SURE HE IS OF SCHOOL AGE, BUT THAT WILL BE EASILY PROVED IF HE HAS A BIRTH CERTIFICATE"
2
THE PROBATION OFFICER: "TOO BAD, SONNY, BUT WE CAN'T LET YOU GO TO WORK UNTIL YOU ARE FOURTEEN, AND YOU'RE SUCH A LITTLE CHAP THAT YOU CANT BE MORE THAN TWELVE"
THE BOY: "HONEST I AM FOURTEEN!"
THE PROBATION OFFICE: LETS SEE YOUR BIRTH CERTIFICATE THEN"
3
CLERK OF ELECTIONS: "SORRY SIR, BUT THE LAW DOES NOT ALLOW YOU TO VOTE UNTIL YOU ARE TWENTY-ONE YEARS OF AGE
THE YOUTH: BUT I AM TWENTY ONE YEARS OF AGE"
CLERK OF ELECTIONS "HAVE YOU YOUR BIRTH CERTIFICATE? YOU WILL HAVE TO PROVE YOUR AGE BY THAT.
4
RIAGE LICENSES
THE MARRIAGE LICENSE CLERK: "THAT KID SAID HE WAS OLD ENOUGH TO GET MARRIED"
CHORUS: "DIDN'T HE HAVE A BIRTH CERTIFICATE?"
THE CLERK: "NO! HE HAD NO WAY OF PROVING THAT HE WAS TWENTY-ONE YEARS OF AGE."
5
THE GIRL'S FATHER: "CLEAR OUT OF HERE, YOU YOUNG SCAMP! I'LL NOT HAVE A NAMELESS IMPOSTER HANGING ROUND MY DAUGHTER!"
THE YOUNG MAN: "I AM —"
THE GIRLS FATHER: "YES THATS JUST IT! WHO ARE YOU?
KATHERINE FIELD WHITE · 1916
6
WAY & TEST
THE LAWYER: "IN PROVING YOUR RIGHT TO YOUR GRANDFATHERS ESTATE AGAINST THE OTHER CLAIMANT, WE MUST OF COURSE PROVE THE KINSHIP—THAT CAN BE DONE ONLY BY YOUR CERTIFICATE OF BIRTH"
THE YOUNG MAN: "I HAVE NO BIRTH CERTIFICATE—THE LACK OF IT HAS BEEN THE GREAT HANDICAP OF MY WHOLE LIFE!"

ILLINOIS STATE BOARD OF HEALTH — CARTOON No 33

A TREE-PLANTING CAMP ON TYPICAL WASTE MOUNTAIN LAND IN PENNSYLVANIA

Reforestation Progress in Pennsylvania

By Jacob L. Crane, Jr.

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IN addition to their great esthetic and commercial value, forests are of critical importance to the full development of certain engineering projects, particularly those for water-supply and water-power. By the regulation of air movement and temperature, forests increase precipitation over timbered areas; both by keeping frost out of the ground and by the formation of a soft mulch on the ground surface, they help materially and sometimes tremendously to store water, to delay run-off, to make the water yield more regular, and to prevent both floods and droughts; they use less water than crops or grass; and they have an important effect on the production of clear instead of muddy water, and thereby incidentally help to prevent the silting of canals and reservoirs.

But usually it is only after the forests have been cut or burned off and the land left bare, that the value of the growing trees is realized. Reforestation can then take place in two ways. First, if they are protected against fire and against competitive growths, volunteer forests may develop. Second, by planting trees and cultivating and protecting them while they grow, artificial forests may be produced. Because of the advantage in being able to grow selected species, to control spacing and to some extent the actual development of trees, this second method has come to be used for most important forest cover projects.

Remarkable progress has been made in this second method of reforestation in Pennsylvania in the last ten or fifteen years, and the growth of the movement promises the development of vast forests over many thousands of acres of unused land. Though much is still to be learned, the business is largely beyond the experimental stage and on a well-established footing of success. State forests now have planted trees 25 feet high and thriving. As a measure of success, it is significant that on the reforestation projects under state supervision, 90 per cent of all conifers planted survive and develop. Scientifically conducted experiments are filling in the deficiencies in the technique of reforestation.

Up to this time a total of about 50,000,000 trees have been planted on 33,000 acres of Pennsylvania land. Of these about 34,000,000 trees are growing on 22,000 acres of state forests, and the remaining 16,000,000 trees are on private projects, 11,000 acres in total area.

Protection of Watershed Areas

Water-supply interest centers in reforestation for the specific purpose of protecting or developing active watersheds—planting on watershed areas. Municipalities have planted 750,000 trees, a large part of these being on active watersheds, and water companies, which plant almost entirely on watersheds, have set out a total of 2,100,000 trees. The phenomenal growth of the business among water companies is shown by the fact that in 1915, 1,150 trees were planted, while in 1919, in the face of advanced costs, nearly 600,000 trees were set out, including those planted by municipalities and water companies, a total of about 1,500 acres of active watershed areas have been reforested by "private" planters, while 5,500 acres of the large state forest projects lie in actively used watersheds. This seems but a small start on the large acreage of reserved drainage areas in Pennsylvania, but the advertising value of the successful projects can scarcely be estimated. Data furnished by water companies now classed as successful planters—and this includes practically all those who have started plantations—are conclusive as to the complete success of the business, and the rapidly accelerating growth of the movement is due largely to the advertising promotional effect of these results.

In considering watershed reforestation it should be remembered that all reforestation is necessarily on land which contributes run-off to some stream—watershed land in the larger sense—and is therefore related to more or less remote water-supply problems in every case. The effect of reforestation in Pennsylvania is sure to be felt eventually on streams originating in Pennsylvania and passing through surrounding territory.

The growth of reforestation in Pennsylvania, particularly among water companies and municipalities, has been promoted very largely by the present plan for state coöperation. From 1910 to 1915, the state furnished trees to planters at actual cost, a figure much lower than the commercial nurserymen's prices. This, coupled with publicity and the beginning of popular interest in conservation, gave the start to sizable private planting enterprise. Beginning with 1915, the state coöperative plan as now administered was organized. Under this plan seedlings and transplants are furnished for the bare cost of packing and shipping to the consumer. This is only from 50 cents to one dollar per thousand seedlings, a fraction only of the cost from commercial nurseries. In addition, the State Forestry Commission, with its staff of experts, supplies free service in all phases of planting projects—selection of land, selection of species to plant, organization and technique of planting, and the maintenance of plantations. In 1919, 791 private planters set out over 3,000,000 trees. Up to this time nearly nine-tenths of all the trees planted by private enterprises have been furnished under the state coöperative plan.

It is worthy of note that the people of the state as a whole, in paying the margin between the cost of producing trees and the cost at which they are distributed by the coöperative plan, will expend in 1920, for perhaps 4,000,000 trees, only about $8,000, or less than one mill per capita, while the potential value to the commonwealth of the resulting forests is enormous. At the same time, about eight-tenths of all the reforestation remains state property.

State Coöperation Approved by Commercial Nurserymen

To prevent the coöperative plan from hurting the commercial nurserymen's business, a rule is established that not less than 500 trees can be ordered and planted under the coöperative plan. The nurserymen's orders are ordinarily for smaller lots, for decorative and landscape work, and this business is stimulated by the state forestry work in all its branches. The commercial nurserymen therefore, instead of opposing the movement, find that it is developing their business, and mutual assistance between them and the state is the fortunate result.

The demand for trees under the coöperative plan is outgrowing the facilities for growing and supplying them. This is chiefly due to the shortage of seed supply. In fact, in recent years the planters have not been able to get all the trees desired of particularly favored species. Therefore the number of the various kinds planted recently is perhaps more a matter of necessity than of selection. The state is able to anticipate the demand with fair accuracy, however, and more and more to provide for it. In this connection it is strange, and perhaps significant of the former lethargy exhibited toward reforestation in this country, that the popular and extremely valuable white pine, which was native in this country only and transplanted to Germany following our Revolutionary War, is now produced here by seeds often procured from the varying and limited German supply.

Excellent volumes have been written on the technique of planting and maintaining forests. It is a highly complex and fascinating art. Fortunately, the aid of the State Forestry Departments makes success fairly certain and failure rare. Results may be predicted with fair accuracy, and the economics and monetary productiveness tabulated before a project is undertaken.

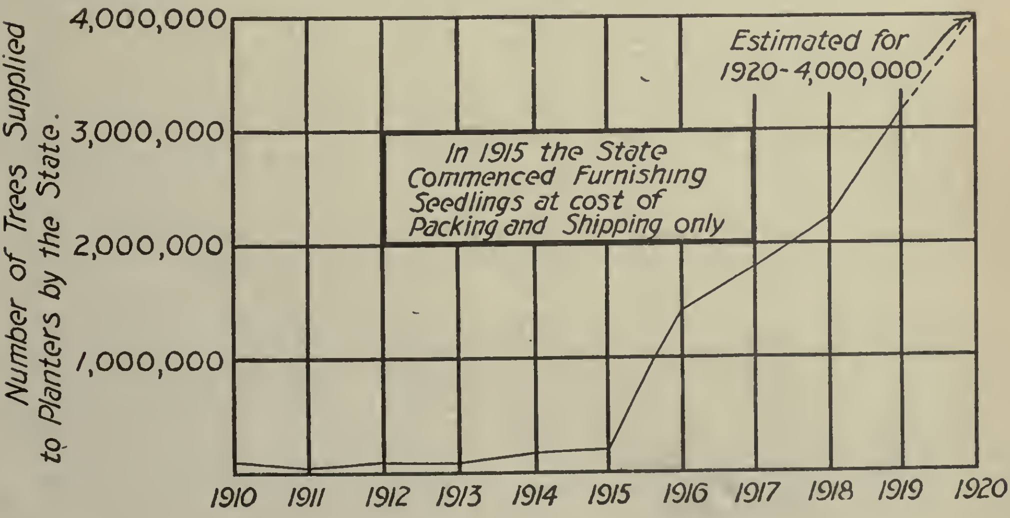
In Pennsylvania, spring planting is most successful, the season extending usually from about March 15 to the end of April, but varying from year to year and in different sections of the state. Fall planting, however, has not been unsuccessful, showing under proper conditions only 10 per cent lower results than spring planting, and it has certain advantages for some trees. The fall season extends usually from about October first to November fifteenth.

One of the most difficult problems is to protect young plantings from the competition of inferior wild growths. During the first couple of years, competitive growth of wild stock protects and aids the sound development of certain seedlings, but as soon as the plants grow to a competitive size, the competition retards and injures them. It then seems to be necessary to cut out the inferior growth to allow the plantation to develop successfully.

Forest Scourges

With a forest successfully started, the greatest dangers are from disease and fire. The "white pine blister rust" has been one of the greatest handicaps to white pine planting in other states, but in Pennsylvania it is happily under complete control, so that to-day there is probably not a single infection of the "rust" in the state. It is an infantile disease usually attacking and killing trees under ten years old, and can be eliminated only by cutting and burning the infected trees and the other hosts, currant and gooseberry bushes. The white pine weevil has not been eradicated, but it is much less dangerous. It attacks the tops of young trees, and when these tops are cut off the tree develops growth through a side shoot which becomes the main stem and at last shows but little mark of the weevil's work.

The greatest scourge of the forests is fire. Forest fires do far more damage than all the diseases and natural causes for depletion put together. The state gives aid and even pays the cost of putting out fires, in the way of publicity to assist in forest fire prevention, and maintains fire wardens. Organized patrolling by the private or municipal forest owners is succeeding very well. Private forest protective associations have been formed which provide coöperative fire protection at a cost of about two cents per acre per year. In the last twenty years, on the 22,000 acres of state plantations, only one-sixth of one per cent of the total area has been burnt over. This represents an annual loss of 0.03 per cent. Disease-prevention and fire-protection methods are more than keeping pace with the growth of the



forest movement, so that chance of loss is steadily decreasing.

One of the interesting features of forest culture is the self-renewal method of operation, by which only a small part is carefully cut each year or so, at a substantial profit over all costs, and the cut areas allowed to seed and reproduce voluntarily from the surrounding wooded tract. Forests of long standing in Europe are operated in this way very successfully and with great satisfaction to the owners and communities. This will probably be the future method of forest production in this country; in fact, it is already established in some forest projects.

The economics of reforestation is of primary interest, but cannot as yet be subjected to exact analysis. Several items are, however, fairly well established.

COST ELEMENTS OF REFORESTATION

	Per M	Per Acre
Seedings from state.....	$ .20-$ 1.00	$ .30-$ 1.50
Planting at present prices.	6.00- 10.00	9.00- 15.00
Total, including contingencies	$7.00-$12.00	$10.00-$18.00

On the state forests during the years 1916, 1917 and 1918 the various elements in planting costs made up the following percentages of the total cost of planting, exclusive of land:

Cost of seedlings	28.72
Cost of transportation	3.63
Cost of camping	14.94
Cost of soil preparation	.94
Cost of planting labor	43.46
Cost of foresters' time	5.20
Cost of rangers' time	2.93
Miscellaneous cost	.18
Total	100.00

In the face of advancing prices, the cost of planting on state forests decreased from $10.77 per acre in 1906 to $4.60 in 1916. War prices have advanced the cost again, but not to the earlier level.

There are available in Pennsylvania at least 3,000,000 acres of land suitable for reforestation. At an average of 1,500 trees per acre, this will support over four billion trees. The monetary value can only be guessed. The result in beauty, satisfaction and improvement to watershed lands and their yield is incalculable, but sufficiently evident to insure the progress of the movement. To the water-works engineer, whose business is the production of more and better water, reforestation as it is being developed holds a certain inspiration.

TABLE 1.—SHOWING VARIOUS SPECIES OF TREES PLANTED IN PENNSYLVANIA IN PERCENTAGE OF TOTAL OF ALL SPECIES

	Percentages of Total Number of Trees Planted		
Species	All Plantations	State Forest Plantations	Private Plantations, Water Companies, Municipalities, etc.
White pine.....	58.0	61.0	46.0
Norway spruce..	15.0	14.0	17.0
Scotch pine.....	9.0	9.0	10.0
Pitch pine......	5.0	5.0	4.0
Red pine.......	4.0	3.0	7.0
European larch.	3.0	2.0	6.0
Jack pine.......	1.0	1.1	2.0
Other conifers..	1.0	1.1	1.4
Total conifers.	96.0	96.2	93.4
Red oak........	1.0	1.2	0.4
White ash......	1.2	1.1	1.8
Honey locust....	0.3	0.3	0.6
Sugar maple....	0.3	0.3	0.6
Black walnut...	0.15	0.2	0.1
Black cherry....	0.15	0.2	0.1
American elm...	0.15	0.2	....
Misc. hardwoods.	0.15	0.2	0.1
Total hardw'ds	3.4	3.7	8.7
Willows & privet	0.6	0.1	2.9
	100.00	100.00	100.00

Acknowledgment.—The author is indebted to Professor J. S. Illick, of the Pennsylvania State Forest Academy, for data and pictures furnished for this article.

A Competition—Suggestions for the Use of an Abandoned Cemetery

The Cleveland City Plan Commission offers a cash prize of $500 for the best suggested use of an abandoned cemetery in its down-town section. The successful competitor, in addition to the cash prize, will receive adequate and permanent recognition in the form of a tablet, or otherwise, if his ideas are embodied in the improvement. No one competitor may submit more than three suggestions, and these must be presented by November 1, 1920. Those desiring to take part may secure plans and full information by applying to the office of the Executive Secretary, City Plan Commission, 435 City Hall, Cleveland, Ohio.

Sanitary Standards for Swimming Pools

By Arthur M. Buswell, M.A., Ph. D.

THE question of sanitary standards for swimming pools is by no means a simple one. At first thought it would seem reasonable to expect that a bacteriological standard might be set for swimming pools, as has been done in the case of drinking water. The United States Public Health Service, for example, classifies all water with a count on agar at 37°C of over 100 bacteria per cubic centimeter, or showing b. coli in more than one out of five 10-cubic-centimeter portions, as non-potable. In choosing such a standard the public health service had the advantage of thousands of standard analyses extending over many years and including samples of waters which experience as well as analysis had definitely classified as either potable or non-potable, to guide them in their decision.

The bacteriological data on swimming pools, however, has been collected under such varying conditions and reported in such a variety of ways that an attempt to correlate the published results simply leads from confusion to chaos.

The inconsistencies in sampling are perhaps the greatest stumbling block. Many authors ignore entirely the importance of obtaining a fair or average sample for analysis, and others state vaguely or neglect to state how their "average" samples were obtained.

Taking the Samples

There are two important points to be borne in mind when taking a sample of swimming pool water for bacteriological analysis if a true idea of the condition of the pool is desired. The first is the time at which the sample is taken. To obtain the true sanitary index of a swimming pool, it is necessary when making tests of this kind to take samples every two to three hours during the time the pool is in use. A pool treated or untreated may change its bacterial content over night, either becoming purified because of the effect of settling, or more polluted on account of bacterial growths.

The second important consideration in sampling swimming pools is the point at which the samples are taken. Samples taken near the inlet will differ from those taken at the outlet, and the top is likely to differ from the bottom. The precautions usually prescribed in sampling drinking water, such as shaking to break up clumps of bacteria, etc., must of course be carefully observed as well. Strange as it may seem, many investigators have ignored entirely these points in sampling and have obtained results which have been misleading to themselves as well as to others.

It appears, then, that there are not as yet sufficient reliable data available to justify an arbitrary bacteriological standard for swimming pools. The authors who have suggested standards seem to be divided into two classes: first, the conservatives who say that a water that is good enough to drink is surely good enough to swim in, therefore swimming pool water should conform to the bacteriological standards for drinking water; second, those inclined to take a rather more liberal and rational view.

The use of index numbers, such as the "bathing load" factor, seems to offer a natural means of judging the probability of pollution. Gage* suggested dividing the number of bathers per week by the capacity of the pool in thousands of gallons. This number, which is directly proportional to the probability of pollution, he calls the "weekly bathing load." Unfortunately, the information required for calculating the bathing load and correlating it with the bacterial observations has not as a rule been given by previous authors, so that time will be required to develop the full usefulness of such index numbers.

Too often investigators have been led by enthusiasm over a series of good results on their own pool to make broad general recommendations on swimming pool sanitation. Those who have had experience with a large number of pools have been forced to the conclusion that "the sanitary control of each swimming pool is an individual problem." Swimming pool directors should be warned against relying upon a given method of sanitary control simply because it "works well somewhere else." The method may not be at all applicable to the pool in question.

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* *Journal of the Boston Society of Civil Engineers,* Vol. 5, No. 6, page 229 (June, 1918).

Although, in the light of the foregoing discussion, it may seem a presumption on our part, we shall venture in conclusion to suggest a standard method of sampling and a tentative sanitary standard for swimming pools. We claim no originality for these standards, but present them as representing, in our opinion, a summary of present views on the subject.

Sampling Procedure

The swimming pool water should be kept at a uniform temperature not exceeding 74° Fahrenheit.

The sample for the determination of the bacterial count of a swimming pool should be a composite sample made up of fifteen 10-cc. samples each of which should be taken from approximately the center of the sections made by dividing the pool surface into fifteen equal parts. The sample from each section should be collected at approximately mid-depth of the section. A 200-cc. bottle should be used for the collection of the 10-cc. samples. The composite sample must be thoroughly shaken before plating.

For a periodic test to determine if the condition of the pool comes within the standard, the sample should be collected immediately after the use of the pool by the average number of daily bathers, and before any treatment, disinfection, or sterilization of the water is made other than that in use during the bathing period.

For testing the efficiency of any method of swimming pool operation for the purpose of determining its efficiency in maintaining a pool within the permissible standard, there should be made a test covering a period of six consecutive days during a time of normal use, with composite samples being collected twice daily. The first composite sample should be collected before use of the pool by bathers. The second sample should be collected from the pool after use, the same precaution being made for collection of the second sample as observed in collecting sample for periodic test.

Sanitary Standard

For the above, it is suggested that the total number of bacteria developing on standard agar plates incubated at 24 hours at 37°C should not exceed 1,000 per cc. Not more than one out of five 10-cc. portions of any sample examined should show the presence of organisms of the b. coli group, when tested in accordance with procedure recommended in reprint No. 232 of the United States Public Health Service reports. The methods and media should be in accordance with the latest approved standard methods of water analysis of the American Public Health Association.

On the Calendar of Conventions

October 10-15.—St. Louis, Mo.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, 404 Lincoln Avenue, Valparaiso, Ind.

October 11-13.—St. Louis, Mo.
American Child Hygiene Association. Annual meeting. Executive Secretary, Miss Gertrude B. Knipp, 1211 Cathedral Street, Baltimore, Md.

October 13-14.—Boston, Mass.
Massachusetts Chamber of Commerce. Annual meeting. Secretary, Edward G. Stacy, 6 Beacon Street, Boston, Mass.

October 13-15.—Amherst, Mass.
American Civic Association. Annual convention. Secretary, E. E. Marshall, Union Trust Building, Washington, D. C.

October 14-19.—Columbus, Ohio.
American Prison Association. Annual congress. General Secretary, Joseph P. Byers, Frankfort, Ky.

October 16-19.—Springfield, Mass.
American Country Life Association. Annual conference. President, Kenyon L. Butterfield, Amherst, Mass.

October 19-22.—New Orleans, La.
International Association of Municipal Electricians. Annual convention. Secretary, Clarence R. George, Houston, Tex.

October 25-27.—Chicago, Ill.
National Association of Commercial Organization Secretaries. Annual convention. Secretary, F. D. E. Babcock, Chamber of Commerce, Worcester, Mass.

November 8-12.—Chico, Calif.
League of California Municipalities. Annual convention. Executive Secretary, W. J. Locke, Pacific Building, San Francisco, Calif.

November 15-17.—Cincinnati, Ohio.
City Managers' Association. Annual convention. Executive Secretary, Harrison G. Otis, 1812 Tribune Building, New York City.

November 16-18.—Los Angeles, Calif.
Fire Marshals' Association of North America. Annual convention. Secretary, George H. Nettleton, St. Paul, Minn.

Fire House Paved with Repressed Brick, Using Asphalt Filler

By Allen D. Dimmick

ONE of the ramifications of street paving presenting certain problems of its own is the selection and construction of suitable pavement for such buildings as fire stations. Although they are not subjected to what nowadays is considered heavy traffic, or to the same extremes of climatic temperature as outside street pavements, fire station pavements have to support heavy and concentrated standing loads and must be kept in a condition of scrupulous repair and cleanliness.

The Central Fire Station of Galesburg, Ill., was paved by J. B. McAuley, contractor, of Galesburg, Ill., in November, 1913, as described below:

On a five-inch concrete base, very carefully surfaced, was placed a 1½-inch sand cushion, which was moistened and rolled with a hand roller. Repressed blocks were laid carefully on edge in straight rows, face edge up, and then well rolled with a five-ton tandem steam roller.

Texaco asphalt filler was then poured from pouring cans, care being taken to fill all joints and interstices. After this a light, dry sand dressing was immediately applied to the surface of the pavement and soon after the surplus sand was removed.

The illustration, photographed in May, 1920, shows the condition of the fire station floor after nearly seven years' service. It is noticeable that the interstices of the brick are still filled flush with the asphalt, which has prevented any chipping or spalling of the brick and kept the whole floor waterproof and sanitary. This fact, as well as the skill and care exercised in the construction, is probably the cause of the satisfaction rendered by the floor. The elastic filler in the brick has resulted also in singularly little noise or vibration being produced by the passage of the heavy fire trucks.

FLOOR OF FIRE HOUSE IN GALESBURG, ILL., PAVED WITH BRICK, USING A BITUMINOUS FILLER

FIRE PROTECTION IS PURCHASABLE.
IT REQUIRES ONLY TRAINED MEN,
DEPENDABLE EQUIPMENT AND
ADEQUATE PUBLIC SUPPORT.

Size and Weight Restrictions in State Motor Vehicle Laws in Effect July 1, 1920

NOTE: In the following tabulations crosses (X) indicate that there are no state laws dealing with the subject. This does not mean, however, that counties, towns and other political subdivisions of the state concerned are also without restrictions upon the size and weight of the motor vehicles which may operate upon the highways within their jurisdictions. In many cases the charters of such political subdivisions or general state laws grant local governing bodies the power to enact ordinances of such a character. As a general rule, however, local ordinances contrary to the provisions of the state laws are forbidden or are unenforceable.

In the weight restrictions column the per inch width of tire limits fixed by the States of Illinois, Iowa, Kentucky and Vermont are based upon the measurement of the contact of the tire with the road; in the case of Ohio and Virginia the distance between the flanges of the rim is the basis of measurement; in the other instances no specific basis other than "per inch of tire width" is prescribed.

State	Size Restrictions	Weight Restrictions	Restriction in Number of Trailers	Special Permits
Alabama	X	X	X	X
Arizona	X	X	X	X
Arkansas	X	X	X	X
California	Outside width of tread 112 in.; outside width of bed of vehicle and load 102 in.	30,000 lbs. gross weight for vehicle equipped with 4 wheels; 40,000 lbs. for one equipped with 6 wheels having its 3 axles at least 96 in. apart. On other than metal tires weight must be distributed not more than 800 lbs. per inch of tire width; on metal 600 lbs. State Department of Engineering may reduce these limits in case of bridges, viaducts, etc.	Two	On application in writing State Department of Engineering may grant permits to operate heavier or wider loads, or more than 2 trailers or increase the permissable weights per inch of tire width.
Colorado	X	X	X	X
Connecticut	Over-all width limited to 114 in.	25,000 lbs. gross weight distributed not more than 700 lbs. per inch of tire width for non-metal tires; metal tires 500 lbs. State Highway Commissioner may restrict use of commercial motor vehicles of over four tons capacity on trunk lines or State aid highways.	X	On application in writing State Highway Commissioner or other authority having charge of the repair or maintenance of any highway or bridge may grant permits, allowing operation of vehicles of more than restricted weight.
Delaware	Width of vehicle limited to 96 in.; height to 146 in.	26,000 lbs. gross weight distributed not more than 700 lbs. per inch of tire width. Gross load of metal-tired trailers limited to 6,000 lbs.	X	State Highway Department may issue special permit to operate vehicle exceeding weight limits.
Florida	X	X	X	X
Georgia	X	X	X	X
Idaho	X	X	X	X
Illinois	Width of vehicle and its load limited to 96 in. Combination of vehicle and trailers shall not exceed 65 ft.	16,000 lbs. gross weight limit for one axle distributed not more than 800 lbs. per inch width of tire.	X	Highway officials may grant permission for operation of vehicles heavier than restricted weight or for trailer trains longer than 65 feet.
Indiana	X	20,000 lbs. capacity	X	X
Iowa	Width of vehicle and load limited to 96 in.	28,000 lbs. gross weight for vehicle and load; 8,000 lbs. for any one wheel distributed not more than 800 lbs. per inch width of tire on hard surfaced highways and 400 lbs. for earth, gravel or similar surfaces.	X	X
Kansas	X	X	X	X
Kentucky	X	30,000 lbs gross weight distributed not more than 800 lbs. per inch width of tire for non-metal tires; 500 lbs. for metal tires.	X	X
Louisiana	X	X	X	X
Maine	X	18,000 lbs. distributed not more than 800 lbs. per inch width of tire.	X	Highway officials may permit operation of vehicles heavier than restricted weights over highways under their control.
Maryland	Width of vehicle 90 in.	20,000 lbs. gross weight distributed not more than 660 lbs. per inch width of tire. Vehicles with rated carrying capacity of more than 10,000 lbs. not registrable.	X	Highway officials may grant permission to operate vehicles heavier than restricted weights on highways subject to their control.
Massachusetts	Outside width 96 in.; over-all length of single vehicle 28 ft.; over-all length of combination of vehicles 66 ft.	28,000 lbs gross weight distributed not more than 800 lbs. per inch width of tire.	X	Highway officials may grant permission to operate heavier or bigger units over the highways under their jurisdictions.
Michigan	Gauge of motor trucks an trailers limited to 76 in measured from center o tire to center of tire Over-all width 96 in. over-all height 12 ft. 6 in. Aggregate length of combination of vehicle 60 ft.	700 lbs. maximum load for tire 2 in. wide up to 3,200 lbs. for 7 in. tire on wheel of 32 in. in diameter. These maximums are greater for wheels of larger diameter, those for 44 in. wheels being one and six-tenths larger.	Two	X
Minnesota	X	X	X	X
Mississippi	X	X	X	X
Missouri	X	X	X	X

State	Size Restrictions	Weight Restrictions	Restriction in Number of Trailers	Special Permits
Montana	X	X	X	X
Nebraska	X	X	X	X
Nevada	X	X	X	X
New Hampshire	X	X	X	X
New Jersey	Length 26 ft. 6 in.; width 92 in.; height 12 ft. 6 in.	30,000 lbs. gross weight distributed not more than 800 lbs. per inch width of tire	One	Highway officials may issue permits for operation of restricted vehicles over highways under their jurisdiction.
New Mexico	X	Rim or tire must be 8 inches or more wide if intended carrying capacity exceeds 2,000 lbs.	X	X
New York	Over-all width 98 in.; height 12 ft. 6 in. (Outside of cities.)	25,000 lbs. gross weight distributed not more than 800 lbs. per inch width of tire. (Outside of cities.)	X	X
No. Carolina	X	11,000 lbs. capacity	X	X
No. Dakota	X	X	X	X
Ohio	X	Tires of rubber or other similar substances 800 lbs. per inch of width on all tires; tires of iron or steel 500 lbs. per inch up to and including 12 inches of total width; 800 lbs. per inch over 12 inches.	X	X
Oklahoma	X	X	X	X
Oregon	X	10,000 lbs. carrying capacity 600 lbs. per inch width of tire.	X	X
Pennsylvania	Width over-all 90 in.; over-all length 336 in.	26,000 lbs. gross weight distributed not more than 19,600 lbs. on one axle nor more than 800 lbs. per inch of tire width.	One	State Highway Commissioner may issue permit for operation of restricted vehicles or more than one trailer.
Rhode Island	X	Without special permit gross weight of trailer limited to 4,000 lbs.	X	State Board of Public Roads may issue permits for trailers with gross weight of more than 4,000 lbs.
So. Carolina	X	8,000 lbs. capacity	X	Highway authorities may grant permit for operation of heavier vehicle.
So. Dakota	X	X	X	X
Tennessee	X	X	X	X
Texas	Width of body 84 in.	6,000 lbs. gross weight per wheel distributed not more than 600 lbs. per inch width of tire.	X	State Highway Department may issue permit for heavier or wider loads.
Utah	X	20,000 lbs. gross weight	X	X
Vermont	Width 96 in.; height 12 ft. 2 in.	12,600 lbs. in towns or incorporated villages, other places 10,000 lbs. gross weight distributed not more than 600 lbs. per inch of tire width.	One	Local authorities may issue permits to operate restricted vehicles over highways subject to their control.
Virginia	X	24,000 lbs. gross weight distributed not more than 700 lbs. per inch of tire width for solid tired vehicles.	X	X
Washington	X	10,000 lbs. for load outside of cities of first or second class.	X	Cities of first and second class may by ordinance permit more than 10,000 lbs. for load within their borders.
W. Virginia	Width 90 in.	30,000 lbs. gross weight distributed not more than 600 lbs. per inch of tire width.	X	Highway officials may issue permit for operation of wider or heavier vehicles over highways subject to their control.
Wisconsin	Width over-all 96 in.; length 30 ft.	24,000 lbs. gross weight distributed not more than 18,000 lbs. per axle nor more than 800 lbs. per inch of tire width.	X	In cities of first class officials may issue permits for operation of trailer trains not exceeding 100 feet in length.
Wyoming	X	X	X	X
District of Columbia	X	12,000 lbs. gross weight on bridges with wooden floors; 30,000 on any other bridges.	One	Engineer Commissioner may issue written permits for operation of heavier vehicles over bridges.

Restrictions Advocated by Proposed Uniform Vehicle Law

Size	Weight	Number of Trailers	Special Permits
Width over-all 96 in.; height 12 ft. 6 in.; length 30 ft. for single vehicle; 86 ft. for combination of vehicles.	28,000 lbs. gross weight distributed not more than 22,400 lbs. on one axle nor more than 800 lbs. per inch of tire width measured between the flanges of the rim.	X	Officials may issue permits for operation of restricted vehicles over highways under their control.

Data courtesy National Automobile Chamber of Commerce

The foregoing restrictions are liberal enough to permit a state to take advantage of the economies which come from the use of the larger commercial motor vehicles; on the other hand, they are low enough and of such a character that vehicular travel on the highways is amply safeguarded and highway foundations and surfaces fully protected from destruction. This is particularly true in the case of weight restrictions where a gross weight of 28,000 pounds distributed not more than 800 pounds per inch of tire width is advocated.

A special committee composed of representatives from the American Association of State Highway Officials, National Automobile Chamber of Commerce, American Automobile Association, and Highway Industries Association drafted the proposed Uniform Vehicle Law, in which these provisions, among others, are recommended for uniform adoption by all of the states. The committee's experience and ability in matters of this sort and the long and painstaking efforts which they gave to the size and weight restriction phases of the subject should make their advice of particular value to the state lawmakers, who in the future may consider laws along these lines.

Who Should Pay for Pavement Between Street Railway Tracks?

By William P. Capes

Director, New York State Bureau of Municipal Information

As a result of a nation-wide agitation by street railway companies within the last year or two, public service commissions and other similar regulatory bodies in a number of states have recommended that state laws and local franchises requiring traction companies to construct and maintain pavements between and a certain distance on either side of their tracks, should be changed so as to relieve the corporation of this expense. Among the state bodies making such a recommendation was the Public Service Commission for the Second District of New York. In its last report to the Legislature it said:

> "The attention of the Legislature is directed to those provisions of section 178 of the Railroad Law which require street surface railroads to have and to keep in permanent repair that portion of any street, avenue or public place between its tracks, the rails of its tracks and 2 feet in width outside of its tracks. In nearly all cities it has been necessary to increase the rates of fares on street railroads, so that the 5-cent fare formerly in common use has been largely superseded by higher rates.
>
> "The Commission is of the opinion that it is highly desirable to return as soon as possible to the 5-cent fare. Increased fares tend to decrease the volume of travel, and it seems evident that in such case the passengers who discontinue the use of street car facilities must in large part comprise that element of the community which most feels the deprivation. The requirement of street paving and repair in the statute referred to constitutes a very heavy financial burden on the urban line, which, of course, must be recouped out of earnings. We beg to point out that the conditions which gave rise to this statutory requirement have, at least in the larger communities, for the most part passed away. At the time of the imposition of this burden there was little track support or pavement. With the cobble or sandstone pavements of that day, laid on sand, there was a strong tendency for those in charge of horses and vehicles to make use of the track as the smoothest part of the roadway. The result was the rapid disintegration of that part of the pavement contiguous to the rails, for which, naturally, the railroad company was held responsible. It will be recalled also that at that period street cars were universally drawn by horses, and the use of the pavements between the tracks by such horses was very great, and contributed in large degree to the wearing out of the pavements. With the present-day heavy construction of both railroad and pavement, supported by concrete, and the substitution of motors for horse-drawn vehicles, these conditions have largely ceased to exist. We therefore believe that the Legislature could with justice require the modification of this requirement."

This summarizes the arguments that have been presented by the traction corporations in support of their contentions that they should be relieved of this item of expense.

As an aid to the cities where efforts may be made to transfer the burden of paving expenses from the traction corporations to the cities or abutting property owners, the New York State Bureau of Municipal Information has prepared a summary of the arguments presented to the Legislature in the briefs submitted by the New York State cities.

The standard type of railroad construction in streets consists of laying wooden ties every 24 inches apart in its subgrades. Its ties are 6 inches in width, 8 inches in breadth and 8 feet in length. On the ties are placed rails which are 4 feet 8½ inches apart. These rails are held together every 16½ feet of track with splice bars belted to the rails, and overlapping the splice bar is a bonding wire transmitting current to the rails.

The ties project 20 inches outside of the rail, and the bonding and splicing bar more than 6 inches in many cases. In a street where double tracks are maintained, the space between the double tracks, usually called the "dummy track," is 56 inches, and with the tie spacing and tie extension as mentioned above, 40 inches of this space is occupied by railway ties.

Heavy urban cars, and not the ordinary travel, are responsible for constant repair to pavements.

The weight of the modern electric car is from 6 to 10 times the weight of the horse-car formerly used. This weight produces a correspondingly increased vibration. As the wheels of the cars become flattened or otherwise defective, the vibration is tremendously increased. Vibration necessarily tends to disintegrate the material of which the pavement is constructed, and the greater the vibration the greater will be the disintegration. In addition, the railroad companies insist on running cars over tracks while the pavement is still under construction, so that a complete bonding of the materials is seldom obtained. This causes a weak point in the pavement, not only along the rails, but for the entire length of the ties (usually 6 feet 8 inches). In cities where the combined load of car and passenger is approximately 25 tons, it is self-evident what happens to that portion of the pavement over the ties and ballast of the railroad company. The injury to the pavement from vibration is infinitely more destructive than any surface wear that could be produced by the travel of horses.

The old cobblestone and sandstone pavements used when horse-cars were operated, were porous, and the penetration of water into the subgrade was unimportant. The modern hard-surface pavement is of rigid construction, and requires for its preservation that the surface be impervious to water. No pavement can be laid as securely with two rails spaced at intervals at the center of the street with the same length of life as on a street which is free from rails. The contour of the street must be altered to provide for drainage along and adjacent to the rails, and the inability of any road-bed construction to withstand the seepage of water into it by creeping along the rails is well known. Water is the enemy of pavement, and the rails provide a means for the water to enter underneath the pavement, undermining it and causing it to heave or rot, depending upon the nature of the paving material. The same degree of drainage cannot be provided on streets on which car tracks are operated as can be afforded on streets which have no car tracks. The rail affords the first opportunity for the water to enter the subgrade. It forms the first point of weakness in the pavement. It is, therefore, the point at which the pavement first shows signs of decay. On Castle Street in the city of Geneva, upheavals from this cause have occurred during the present spring between the tracks and for a distance of 15 feet outside of them. The weight of traffic over the pavement in this upheaved condition results in a most destructive collapse or breaking up of the pavement.

It is impossible to maintain any modern satisfactory pavement adjacent to any car track construction unless such track construction is made rigid. The incentive to make such rigid construction now rests with the traction company, to lessen the cost of pavement maintenance. With such incentive for the more expensive track construction removed, the company would naturally resort to a cheaper track construction, resulting in an increased cost of pavement maintenance, or would make such pavement most difficult, if not impossible. The enforcement of pavement maintenance under the present law works practically to compel proper track construction and maintenance. No relief from present obligations can be reasonably considered, except in conjunction with thorough control of track construction and maintenance by the municipalities, without soon creating an impossible condition of street pavement maintenance.

In case a company is to construct a track in a street already paved, it becomes necessary to tear up at least 9 feet of pavement in order to lay the tracks. This pavement has already been paid for once, and it may be relaid after the tracks have been placed, in such a way that it is apparently on the surface as good as new, but there is a longitudinal crack in the base which eventually works toward the surface under the stress of constant vibration. This in a short time would mean constant repair.

In the case of replacing of ties, etc., by the railroad company, it is necessary to take up and replace a strip of pavement approximately 9 feet wide. This is a charge which in all fairness should be paid by the railway company. Long before the expiration of the life of the road-bed the railway company is compelled to disturb the pavements to shin joints, renew bonds, replace broken rails and retighten joints, and in performing this service it is necessary to disturb 20 inches of pavement in order to make working room for men and their tools. It is found necessary to renew ties, even though they be embedded in concrete before the pavement has served its life.

The constant tearing up of the pavement to repair car tracks is very detrimental to the condition of a street. A pavement which has been torn up cannot be restored to as good condition as before, consequently the location of railway tracks in a street

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necessarily tends to destroy the life of the whole pavement.

General street railroad engineering has established the fact that repairs to paving in the railroad area consume 17 to 20 per cent of the total cost of maintenance of way, so a reduction of 7/9 of this obligation would not help the railroad company more than the additional cent charged in a 6-cent fare.

The life of the road-bed of a railroad company is about 12 years, and the life of a durably constructed pavement is over 20 years.

It is a well-known fact among engineers that no matter how well a pavement is constructed, it will heave along rail lines and does not settle back in the spring as it should. Each year increases the degree of this trouble. This cannot be attributed to vehicular traffic, for in these days the majority of vehicles are motor-driven, which usually means rubber tires, and it is the practice of most good drivers to keep as far from the rails as possible, if for no other reason than the protection of tires. It is also well known that street railroad companies use quantities of salt around switches in the winter time, and this has a very serious effect on pavement.

The life of a pavement on any street in which street cars are located is reduced 50 per cent. As an illustration of this fact, I refer to Genesee Street in Geneva. There are no cracks from Castle Street to Lewis Street, and the pavement on this part of the street is in excellent condition, while the pavement on the rest of the street, in which tracks are located, is now in such condition that immediate repavement is necessary, although both parts of the street were paved at the same time and with the same kind of pavement.

Defective rails cannot be properly removed and replaced in a 1-foot area, particularly on curves.

Cities should not be required to pay for the cost of greater excavation and heavier construction required under tracks, which are necessary purely for the support of a company's cars.

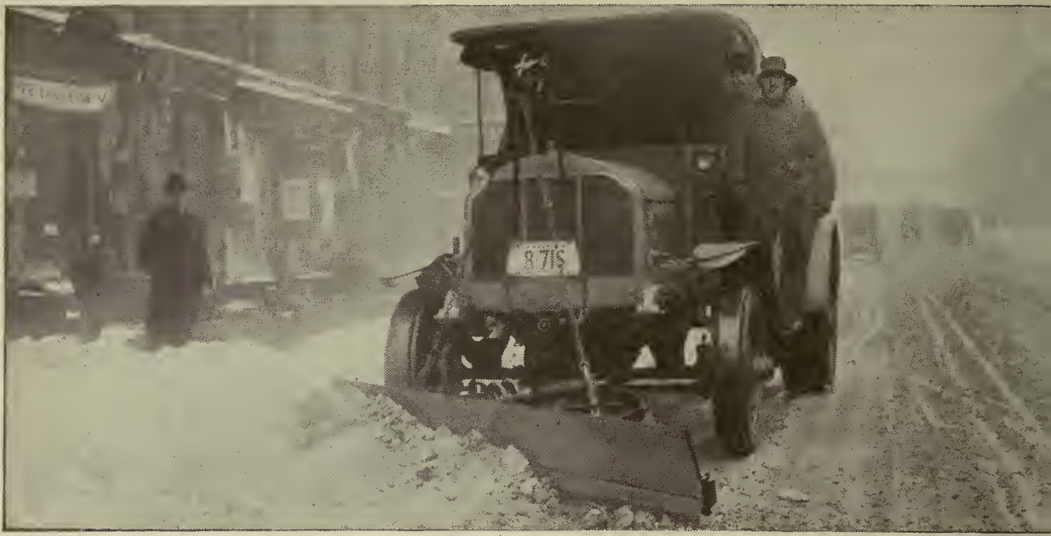
The presence of street railway tracks in a street necessitates a special and more expensive construction of pavement. It is necessary to make the concrete foundation 8 to 10 inches in depth between the tracks and at the side of the tracks, instead of 5 inches in depth, as in other parts of the street. This special construction has to be carried the full width of the ties (8 feet) and 6 inches beyond on each side, making a total width of 9 feet for a single track. As the railway companies now use T rails instead of flange rails, this necessitates the use of a special type of brick on the inside of the rails, which is more expensive than the regular paving brick. The fitting of these bricks to the rails also involves additional expense in laying the pavements.

The presence of railway tracks requires an increased width of the pavement. This is necessary in order to permit traffic on both sides of a car. Our residence streets are ordinarily paved 24 feet in width, but in a street in which a single railway track is located we consider that a pavement of 36 feet in width is necessary. Under the present law the railway company does not pay the whole cost of this additional width. It would be most unjust to throw a greater share of the cost on the property owners when the necessity for the additional width results entirely from the use of the street by the railway company.

In repairing or connecting water or sewer mains, it is often necessary to excavate under the tracks while cars are in operation, at a considerable additional expense over what such work would cost in streets where there is no street car traffic.. Property owners, likewise, in laying sewer or water laterals are burdened with similar extra expense.

The usual method of proceeding with paving work is by incurring a funded debt on the part of the city for its portion of the expense, and if the road-bed of the railroad company, which has a life of only about 12 years, is to enter into the issuance of bonds by the municipality, which usually extend over a period of 20 years, it will demand of the railroad company such a type of construction as will clearly outlive the issuance of bonds. Our experience with the methods of track construction used by street railway companies in paved streets is that they are of inferior character and have subjected the city to an expense which would not have been encouraged had no tracks existed on paved streets.

In cities where large snowfalls must be anticipated, the operation of snow-plows and snow-sweepers tends to break down the pavement between the rails. We maintain



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that the city should not be asked to correct conditions due to the operation of plows, etc.

It is fallacious to believe that the conditions existing to-day relative to the destructive influence of trolley tracks and the operation of trolley cars over them, are not the same as they have always been. The traction companies' false idea of economy in general has been a reduction of the first cost in the ballasting of their tracks. This, in conjunction with the rapidly increasing weight of cars, has extended the circle of influence of destruction more than 2 feet outside the outside rail.

If the traction companies are relieved of this obligation, the increased cost of pavement and repair is thrown back on property owners by assessment for local benefits derived, or, if a general improvement, new revenue has to be obtained by an increase of the general tax.

If it is a question of financing the work, surely the railroads, and indirectly the people who use them and benefit therefrom, should stand this cost, and not the entire community. Not over 50 per cent of the population have occasion to use the railway, and it does not seem proper to ask those who derive no benefit therefrom to help pay the construction and repair which would be the case if there were a charge on the city.

The statute which it is proposed to amend is fair to the railway company in that the area of street pavement which it is now obliged to maintain is that area within which experience of many years has shown the street pavement is particularly affected by the maintenance and operation of its lines.

The presence of poles between the tracks limits the surface area of the street available for traffic, and distributes over that portion of the street outside of "the dummy" more traffic than would ordinarily come on it, so that the practical result is that the railroad companies appropriate to their exclusive use that portion of the street between the tracks where the trolley poles have been installed between them.

In the borough of Manhattan in New York City all of the street surface railroad companies are operated with the underground electrical system, which requires the installation of so-called "channel" or "slot" rail in the middle of the space between the two rails of each track, so that in the center of the space between the rails, which, under the proposed bill, the city would be obliged to repair, we have a railroad structure the maintenance of which requires constant interference with the pavement between the rails and the tracks, and we have, further, manhole boxes, so-called, every few feet, approximately a foot square, the metal covers for which are located in the space between the slot or channel rail and rail of the track. These covers when placed opposite to each other on either side of the channel rail, as they frequently are, occupy almost the entire space between the two rails of the tracks. In the type of construction to which we have referred it will readily be seen that the pavement between the rails of the tracks is divided by the railroad structure into oblong strips or a series of small patches. These railroad structures tend greatly to diminish the life of the pavement. The traffic in the city of New York is very heavy, and when the wheels of a heavily loaded vehicle pass from the metal structure of the railroad companies onto the pavement, there is a grinding or wearing effect on the pavement, which, being softer than the metal structure, is soon ground and worked away. Ruts, holes and depressions first appear in the pavement immediately adjoining the rails of the tracks and by the traffic are gradually extended so as to include the entire space between the rails of the tracks and several feet outside of the outer rails of the tracks.

Nine feet, a dimension controlled by the 8-foot railroad tie, should be definitely marked off by construction joints, and 9 feet built and maintained by the railroad company. This places entire responsibility for damages to subsequent failure within the railway strip, where it belongs.

If expense for pavement adjacent to rails and 2 feet outside has heretofore been deemed a legitimate charge to street railway companies, a change is not considered justifiable now in the light of the usage of the heavy cars, higher speed and more frequent operation.

A railway company is constantly ripping pavements to repair its street car tracks. It is absolutely impossible for a company, were it to maintain only 6 inches in width on each side of its rails, properly to repair its tracks without disturbing other parts of the pavement, this necessitating an added expense to be borne by the city.

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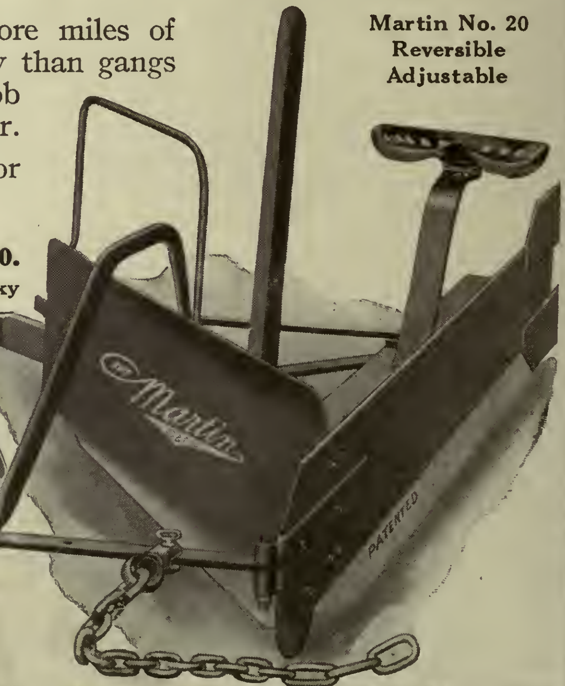

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A Well-planned Municipal Report

FINANCIAL statements and reports upon the administration of a municipality's affairs are usually noted for their obscurity. In consequence there is often a suspicion that public funds are not being efficiently expended in the best interests of the people.

In making a report to the citizens upon the administration of a city's affairs and possible future development of the community, so that maximum benefits will be received at a minimum of cost, facts and figures should be presented in an attractive and illustrated form so that they can be understood by every citizen. Without that coöperation the best results cannot be obtained.

In the Province of Saskatchewan, Canada, the government of cities is controlled by a common City Act which stipulates that a report upon the administration of the city's affairs must be presented to the ratepayers at a public meeting two weeks before the annual election of aldermen, the intention being to furnish the citizens with information of the city's affairs so that they can intelligently vote at the ensuing election.

The writer found that very few attended these meetings and the cause was chiefly the fact that it was very tedious to sit and listen to lengthy reports containing innumerable statistics being read from a statement.

The policy was then adopted of illustrating the report with graphs, diagrams and photographs thrown upon a screen; and instead of reading the report it was delivered in the form of a speech and each diagram and graph fully explained.

This method resulted in making the annual meetings very much more interesting. The citizens could see from the diagrams at a glance how the city's tax levy was apportioned, how the expenditure was made in relation to the appropriations, how the taxes were being collected, how expenditures and revenues compared with previous years, how the electric light and power load was increasing, how the street railway traffic was decreasing or increasing, how the city's future requirements and development should be dealt with.

Then last year, 1919, a further innovation was inaugurated in order to make plainer, if possible, to every citizen the true position of the city's affairs. The writer put himself in the position of a ratepayer who wanted information about the city and asked himself the following twenty questions and the report constituted the replies. The answer to each question was illustrated with a graph, diagram or photograph so that the information was made as plain as possible.

SECTION I.—Current Revenue and Expenditures

1. How does the city administration obtain its revenue?
2. How is the citizens' money expended?
3. What is the total amount paid by the city in wages and how has this amount varied since 1913?
4. What is the total amount of the tax levy and how is it distributed?
5. How do tax collections this year compare with previous years, and what amount is in arrear?
6. What amount does the city owe its bankers on current account?
7. Will the city obtain title to much property as a result of tax sales, and what will be its policy in regard to same?
8. How are the city's services administered and with what results?

SECTION II.—Capital Revenue and Expenditures

9. What is the amount of the city's debt; how has it been incurred; and what are its limits?
10. When must the city's debt be paid off?
11. What provision is being made to pay off the debt?
12. What investments have been made with the sinking fund, and with what results?
13. What effect has the city's debt upon the annual tax levy?

"Tarvia-KP" sand and stone are turned over by hand until all stones are coated

The hole to be patched is cleaned out and the bottom and the sides are painted with "Tarvia-KP"

The mixture is shoveled into the hole and is well tamped

Workingman in foreground is scattering screenings over seal-coat. Then patch is again tamped

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SECTION III.—Public Utilities

14. What public utilities do we own and how much capital have we invested in them?

15. What are the operating costs, revenue, etc., of each utility?

16. Do you consider that ownership of the public utilities by the citizens has been a success, and will rates have to be increased to continue their profitable operation?

SECTION IV —Future Requirements and Development of City

17. What will be the effect on the annual tax levy if the proposals of extending the Hospital, the Collegiate, and the Public Schools, etc., are carried out next year?

18. What do you consider are the most urgent requirements of the city, affecting its future development?

19. What can be done to provide better facilities for recreation, and how can they be obtained without increasing the city's debt?

20. What will be the effect on the city's supply of water, if the towns and cities in the south part of the Province obtain their supply from the South Saskatchewan River?

The above method of presenting the report resulted in a crowded meeting of citizens and the whole of the phases of the city's government appeared to be clearly understood by those present. One of the greatest drawbacks to efficient municipal government to-day is the lethargy of the general public, which has been fostered by obscure, unintelligible and uninteresting reports. The Saskatoon plan for presenting a municipal report will do much toward changing this apathy to intense and general interest in civic affairs.

C. J. YORATH,
City Commissioner, Saskatoon, Canada.

National Community Board Organized

To encourage the community center movement throughout the United States and to promote a citizenship organization on a democratic basis, there has been incorporated in Washington, D. C., the National Community Board. The moving spirit in the new organization, and its first president, is Henry E. Jackson, who, until the recent discontinuance of the Community Center Division of the United States Bureau of Education, was the Bureau's special agent in community organization. The other officers are: Vice-President, Oliver P. Newman; Secretary, Ray G. Edwards; Treasurer, Benedict W. Law.

In addition to the general training in citizenship through its continuous practice in community centers, the National Community Board will aim to promote, as a community center activity, the organization of all young men and women, previous to their twenty-first birthday, into special training clubs, and to suggest the methods by which they may Americanize themselves and secure better equipment for the duties of citizenship.

The Board expects to arrange each year for the meeting of a National Assembly for the purpose of enabling its members to make a special study of the science and art of community organization, to learn about the progress of community development throughout the nation, and to assist each other by pooling their experience.

It is planned to finance the work of the National Community Board by raising an endowment fund, the conditions of which are specified as follows in the certificate of incorporation:

That at the end of twenty-five years the Board shall go out of business as a promoting agency, and that all funds in its possession at that time shall be returned or otherwise disposed of, as any individual donor may designate;

That the portion of the endowment fund raised by popular subscription shall, at the end of twenty-five years and in proportion to the amount contributed by the citizens in each state, be given to the Department of Public Instruction or other public educational agency in each state, to be used for the promotion of democratic community organization in any way such agencies may deem wise;

That any unconditioned trust funds or other property held by the Trustees shall, at the end of twenty-five years, be transferred by them to a similar agency, existing or to be organized, in order to maintain a national headquarters as a service station for furnishing information and a training school for social engineers.

If fire drills won't do —What?

"I CAN'T believe it—a fire in *one* hospital out of every *eleven*, each year," said the famous surgeon. "That shows the need for radical action."

"Frankly, I'm puzzled," he said earnestly, "we've tried drills again and again, of course. But they are unwise for hospital use."

"Even when the patients are told several times that a fire drill will occur at a certain time, even with low-toned gongs and the drills executed in the quietest way, often we have had very serious set-backs to some of our more nervous patients, because they were afraid that it *might be a real fire.* What are we going to do?"

Suppose hospital fire drills were practical. They are not *sure* of saving lives—and they *can't* save the buildings. But Grinnell Automatic Sprinklers can *do both—and do.* With Grinnell Sprinklers, nurses and doctors won't need to live and work in constant dread of extra-hazardous rooms, X-ray machines, alcohol lamps, electrical devices, inflammable materials, and the like. With Grinnells on duty, day and night, even the patients have perfect assurance that they are really safe. They know that when the fire starts, the water starts.

Not all hospital authorities, or even the hospital architects, realize the great need of sprinklers for hospital buildings. Perhaps it is partly due to this fact that we have such an appalling number of dreadful hospital fires—one fire each year to every eleven hospitals.

Read — *"Fire Tragedies and Their Remedy"*

Our book "Fire Tragedies and their Remedy" touches on the subject of hospital fire traps and hospital fire safety, and if you would like to have a copy for your own information and use, we shall be glad to mail one to you. Just drop us a one-cent postal—TODAY. Address, Grinnell Co., Inc., 283 W. Exchange St., Providence, R.I.

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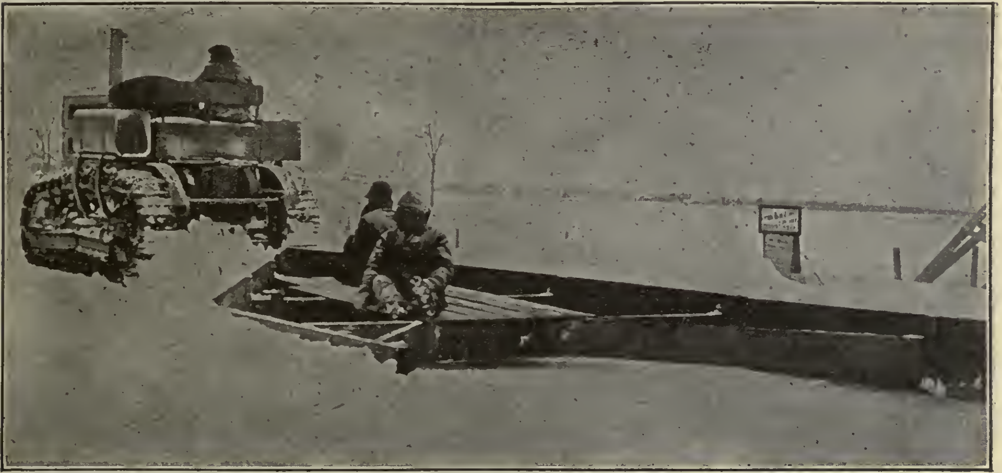
Using the Tractor to Clean City Streets

Tractor Hauls Snow-Plow After Eleven-Inch Snowfall in Grand Forks

By G. S. Giles
City Engineer, Grand Forks, N. D.

THE winter of 1919 proved so trying to many municipalities in the matter of keeping streets open that many unusual devices have been put into operation thruout the country for this purpose. While in Grand Forks it is not necessary to completely remove the snow from the streets, as is the case in more congested communities, it is very necessary that drifts be removed and that the streets be made reasonably clear for traffic.



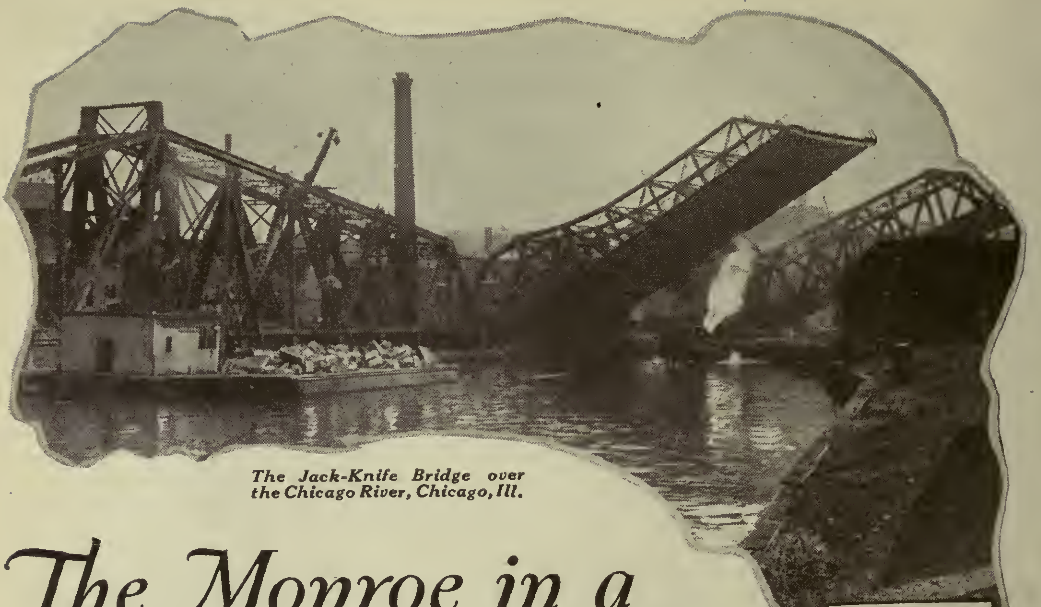
A CATERPILLAR TRACTOR HAULING A HEAVY SNOW-PLOW IN GRAND FORKS, N. D., BREAKING OPEN THE ROADS AFTER HEAVY SNOWFALL

On November 10 the first heavy fall of snow came to Grand Forks. It amounted to 11 inches falling in 24 hours, accompanied by a high wind, which drifted the snow from 2 to 3 feet deep on some of the streets. In order to attack these huge drifts, a snow-plow was built of 2-inch planks, 2 feet high and with a spread of 15 feet, with extended parallel sides of 8 feet in order to keep it from sluing. On November 18 a demonstration was held in the city, when this new heavy snow-plow was hauled by a Holt tractor to open up the street.

Between November 10 and 18 there was a thaw and the snow was wet and hard to handle, but the tractor successfully hauled the plow and opened the streets in a very satisfactory manner. The City Council expressed its willingness to purchase the tractor to be held in readiness for this type of work and other municipal hauling during the summer, but there was no appropriation in the street fund to cover the expenditures, so it was impossible to purchase it at that time. From the demonstration the municipal officials were well satisfied that this method of opening up streets is satisfactory, economical and thoro, particularly if it is possible to get on the streets during the storm or immediately after it, before traffic is moving and packing the snow.

Snow Removal a Fire Prevention Measure

As a check on the ravages of fire, the clearing of city streets is important, for with a clear roadway the heavy motor fire apparatus can operate with the same facility as in summer.



The Jack-Knife Bridge over the Chicago River, Chicago, Ill.

The Monroe in a City Engineer's office

City of Chicago
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"We find the Monroe Calculating Machine to be very satisfactory as a *time-saver in* making our *cost* and *time records* and in preparing *engineering estimates.*"

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IN the office of Chicago's Engineer of Bridges, the figure-work in connection with bids, etc., must be completed in the shortest possible time.

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News and Ideas for Commercial and Civic Organizations

Olathe's Water-Supply to be Increased

Olathe, Kans.—The Olathe Chamber of Commerce was recently asked by the City Commissioners to make an investigation of the water-supply system of the city and submit recommendations for its improvement. This was done. The investigation revealed that one of the reservoirs located three miles west of the town has a capacity of 50,000,000 gallons, and that two smaller ones located within the city have a combined capacity of 35,000,000 gallons. The largest reservoir was built only five years ago, but the engineer did not realize that there would be an increase in consumption from 75,000 to 175,000 gallons per day in five years.

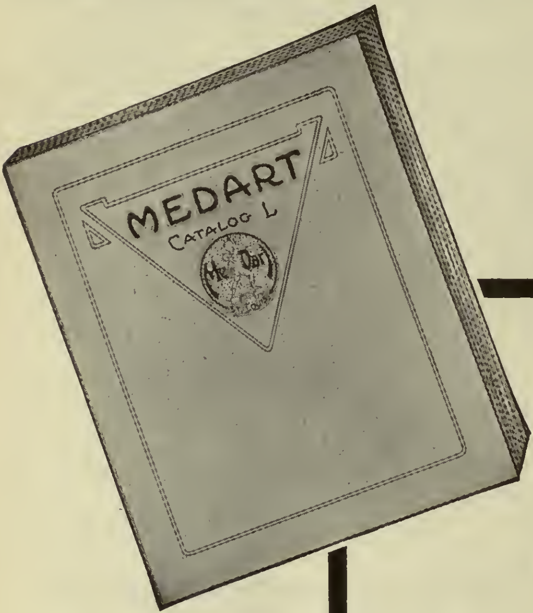
In looking about for ways and means of increasing the water-supply, the Chamber's committee found a very desirable site below the present dam, which would provide the city with an almost inexhaustible supply of water but would call for an expenditure of from $150,000 to $175,000. Only $65,000 was available for the improvement. Another recommendation was therefore made which called for the addition of five feet to the present dam. This would increase the capacity from 50,000,000 to 100,000,000 gallons, and would cost from $45,000 to $50,000, including the cost of the land that would have to be condemned. The last recommendation was accepted by the Commissioners, and plans and specifications were drawn, and submitted to and passed by the State Utilities Commission. Work on the dam will be started soon.

L. E. DIVELBISS,
Secretary, Olathe Chamber of Commerce.

Boy Scouts Aid in Rat Extermination Campaign

Florence, Ala.—The Florence Chamber of Commerce recently conducted a rat campaign in which five Boy Scouts figured conspicuously. The Chamber secured 125 official traps, which were distributed among the five boys, who were offered five cents per rat by the Chamber of Commerce for every one they would catch. The services of an expert rat-catcher from the United

A FEW OF THE BOYS WHO ENGAGED IN THE RAT EXTERMINATION CAMPAIGN CONDUCTED BY THE FLORENCE, ALA., CHAMBER OF COMMERCE



The Recognized Textbook on Playground Planning —

This 128-Page Medart Catalog is recognized everywhere as a text-book on Playground Planning and Installations. It shows in detail just what apparatus is best suited for boys, for girls and for smaller children. It shows ideal playground layouts, where cost is secondary to service and it shows, too, what combinations are most desirable for smaller communities or centers where only a limited appropriation is available.

And, of course, it points out convincingly just why you should always specify Medart Playground Equipment.

Add this elaborate book to your library—it is an actual help to anyone interested in Playgrounds and Playground Planning. Sent promptly on request.

FRED MEDART MFG. CO.
Potomac & De Kalb Sts.
St. Louis, U. S. A.

States Public Health Service were secured to assist in the campaign.

These five boys, with the assistance of a number of other boys whose services had been enlisted, caught over one thousand rats in ten days. The rodents were brought to the Chamber of Commerce and paid for, dipped in kerosene and sent to the incinerator. The Chamber expects to conduct such a campaign annually hereafter.

H. H. DUNN,
Secretary, Florence Chamber of Commerce.

Census Recount Provides New City Directory

Portland, Ind.—Our little municipality was greatly disappointed over the results of the government census, which credited Portland with 5,958 inhabitants. With our nineteen thriving industrial plants rapidly expanding, an oil boom in full swing and every business and residential property in the city occupied, it was only reasonable to expect that Portland's population would show an increase of at least 2,000 over the 1910 census figures of 5,130. The government announcement created general dissatisfaction, and many leading citizens entered strong protests with the Portland Commercial Association urging that the organization take steps to secure a recount. Negotiations with the census officials revealed that it would be impossible to have this done, hence the Commercial Association decided to undertake the work. A practical plan was evolved whereby the city's population could be correctly counted and the enumeration made to pay for itself by compiling the information thus gathered into a new and much-needed city directory.

The new enumeration was taken as of July 1. College students, home on their summer vacation, solved the problem of securing intelligent and capable canvassers and did the work for the price of one cent for each person enumerated. The enumeration blank, which was filled out for each family and adult, includes the full name, age, street address, occupation, name of employer, how long a resident of the city, and whether or not the person owns real estate, especially his home.

The new directory, which is now being prepared, will contain in addition to the alphabetical arrangement of names, a classified business and public official roster, railroad time-tables, a street directory, and other detailed information concerning the city which is in every-day demand. No business or commercial advertisements, other than those the Commercial Association uses in its program of community publicity, will appear in the directory.

As no city directory of Portland has been published for six years, this work is proving a very valuable service to the community, which is evidenced by the fact that the first edition of 600 copies has already been over-subscribed, even before it is off the press, at a price of $1 a copy. This price just covers the cost of the enumeration and the printing. It is about one-third that charged for former editions put out by professional firms, and our merchants are not called upon to finance its publication through their advertisements. The new directory will prove an excellent medium for publishing the Commercial Association's community advertisements, which makes it unnecessary to call upon the publicity fund for this particular purpose.

The increase in population which it is now certain the enumeration will show will be a great encouragement to those loyal and public-spirited citizens who have been working for a better and a bigger city, for it will show that their work is bringing material results.

KEITH SPADE,
Secretary-Manager, Portland Commercial Association.

Policeman Secured Quickly Through New Signal System

Webster, Mass.—Realizing the lack of police protection to the people of Webster and Dudley through the absence of an adequate police signal system, the Webster-Dudley Chamber of Commerce recommended to the Chief of Police the installation of a signal light and telephone on Main Street where it would be easily accessible at all times. The Chief welcomed the suggestion, and a No. 40 marine signal light was accordingly purchased and placed on a post in the center of the town. A special telephone was installed on the same post and arrangements were made with the Telephone Company whereby the operator receiving a call for a policeman would immediately switch on the signal light and plug in on the special line. A police officer is always within a short distance of this light and can answer it immediately through the special telephone.

In a test case by newspaper men, an

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Whether used in the city street, the country road or state highway, Newport culverts give dollar for dollar service. In all the years we have been making these durable culverts, we have yet to receive a complaint regarding unsatisfactory or defective service. However, we have received dozens of letters complimenting us on the merits and the lasting qualities we have put into our products

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DON'T FORGET TO LAY NEWPORT CULVERTS NEXT TIME. ONCE LAID, YOU CAN FORGET ABOUT THEM.

SEND YOUR ADDRESS FOR FREE BOOKLET

NEWPORT CULVERT CO.
542 WEST 10TH ST.
NEWPORT KENTUCKY

officer answered the telephone in less than two minutes from the time the newspaper men filed the call.

This is really only a temporary measure, but it shows the advantage of a police signal system over the old method of calling several stores on Main Street in an effort to find an officer. Specifications and prices have already been secured for the installation of an up-to-date system which will require a man to be on duty at the central office at all times. It is hoped that the great usefulness of this light will impress upon the citizens the value of having a special system of lights and regulation police boxes installed all over the town.

HARRY L. NADO,
Formerly Executive Secretary, Webster-Dudley Chamber of Commerce.

How the Hagerstown Chamber Met the Need for Homes

Hagerstown, Md.—One of the principal items in the program of work adopted by the Hagerstown Chamber of Commerce when it was organized in 1918-19 called for the relief of the local housing situation. It was not until the summer of 1919, however, that definite action was taken. At this time the Chamber ascertained by means of questionnaires that there were at least one hundred men employed in the principal industries of the community who would buy homes if they had an opportunity. With this information in its possession, the Chamber organized a committee to devise ways and means, which, after several months' work, brought forth the plan of organizing the Hagerstown Homes Corporation.

The Homes Corporation issued stock to the amount of $100,000, which was subscribed for by the leading industries as well as many private individuals in the city. The stockholders of the newly formed corporation then took control, and at this point the work of the Chamber of Commerce ceased and the new-born organization proceeded to its business of providing homes.

During the fall and winter of 1919 numerous plots of ground were purchased in central locations throughout the city. In the meantime a competent manager was appointed, who was instructed to look into various types of construction with a view to selecting the type best suited to the city's needs. A large quantity of government material was purchased at a great saving in cost. Early in the spring of 1920 actual construction was begun, and at the present time seventeen houses are completed, and other groups will shortly be started. The homes are being sold on very liberal terms after the following plan:

The purchaser pays on delivery of deed 10 per cent of purchase price in cash.

Any of the local banks accept a first mortgage for 75 per cent of purchase price.

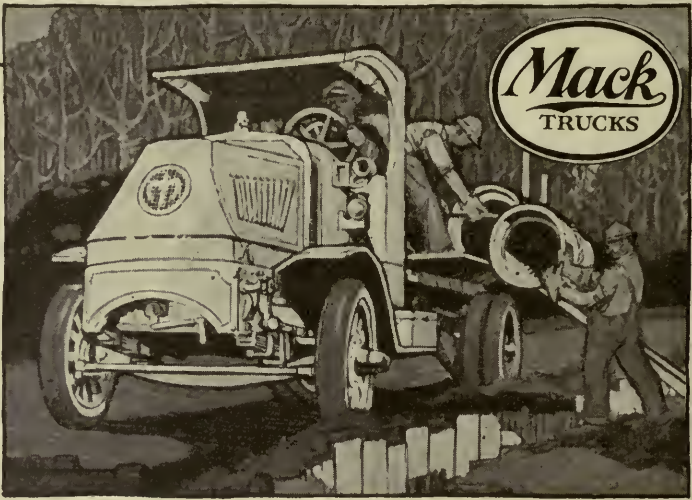
The Hagerstown Homes Corporation takes a second mortgage for 15 per cent of purchase price.

The purchaser under the terms of the second mortgage pays to the Hagerstown Homes Corporation monthly payments equivalent to one-twelfth of 10 per cent of the purchase price, which payments are applied, first to the interest on the first and second mortgages respectively, and the balance at the end of each six months' period to the reduction of the second mortgage until the latter is paid off.

To the Hagerstown Chamber of Commerce belongs the credit for starting and pushing to a successful conclusion the organization of the Homes Corporation. Many difficulties were encountered in getting the project under way, but now that satisfactory results are being secured, the men who put their time and effort into the work feel that it was well worth while.

SIMMS JAMIESON,
Manager, Hagerstown Chamber of Commerce.

A PANORAMIC VIEW OF THE HOUSES IN PROCESS OF CONSTRUCTION IN HAGERSTOWN, MD., BY THE HOMES CORPORATION, ORGANIZED BY THE HAGERSTOWN CHAMBER OF COMMERCE



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Official government tests disclosed the verifying fact that a 5½-ton chain-driven truck had only 68% of the destructive road-impact of a 3-ton enclosed rear-drive truck. This is one of the reasons why the makers of the Bull Dog Mack have permanently retained and perfected the chain drive. It has made the Mack conspicuously successful in fulfilling municipal requirements everywhere.

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Capacities 1½ to 7½ tons—Tractors to 15 tons

Our latest catalogues, Nos. 13 and 39, contain a detailed description of the many exclusive features that have made Mack supremacy possible, together with the complete specifications of every model. Send for them today.

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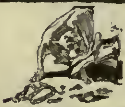

"PERFORMANCE COUNTS"

Taxation in Ohio

Cincinnati, Ohio.—Thirty-two chambers of commerce working together for the financial relief of their respective cities and all the other municipalities of Ohio affords an interesting spectacle.

Some years ago the Ohio State Legislature passed what is known as the Smith One Per Cent Law, limiting the tax rate to one per cent of the taxable valuation of all property in any taxation district without a vote of the people, and to one and one-half per cent with a vote of the people, plus certain sinking fund and interest charges which were exempted from the above rates.

It was expected that the law would force up tax valuation approximately to the sale value of property and compel greater economy in public expenditures. In a measure it accomplished the former, and for a time public expenditures were held down in some degree. But the demands of the people for better living and additional governmental service beyond that known to their grandfathers, combined with advancing prices, made it absolutely impossible for municipalities to live within the limits provided by the Smith Law.

Cities in Trouble

Conservative spending was followed by reckless municipal finance, including the issuance of bonds for current expenses and ever-growing deficiencies. Most of the cities of Ohio, therefore, are facing bankruptcy, and previous efforts to solve the problem have not succeeded. Within the past year a joint committee of the State Legislature rendered a report and drafted certain bills providing for a revision of the taxation system of the state. These failed. Remedial legislation was passed, but it failed to correct the difficulty.

Perhaps in no other city of the state is financial relief needed more than in Cincinnati. For this reason the Cincinnati Chamber of Commerce became interested.

On May 5 Dr. D. Frank Garland, Director of Public Welfare of Dayton, Ohio, spoke at a forum meeting of the Chamber of Commerce on "A State-wide Program of City Finance." In the meantime, C. R. Hebble, Executive Secretary of the Cincinnati Chamber of Commerce, suggested that the chambers of commerce of Ohio could do more than any other group to bring together the varied interests for a solution of the problem. Accordingly, at the annual meeting of the Ohio Commercial Secretaries' Association, held in Cincinnati on May 21, 1920, Mr. Hebble proposed that a meeting of representatives of all the chambers of commerce of the state be held at Columbus some time in the month of June for the purpose of devising some practical plan for the financial relief of cities. He urged that at the very outset of the proposed meeting all should bury their differences and "agree to agree."

The Commercial Secretaries' Association thereupon asked the Cincinnati Chamber of Commerce to call the proposed meeting. It was held on June 18 at the Columbus Chamber of Commerce, and was attended by about 75 persons representing 32 chambers of commerce in the state. Lowrie G. Sater, of the Columbus Chamber of Commerce, was made permanent chairman, and an all-day session ensued. Regardless of differences, everybody approved the proposal that all should "agree to agree."

Before adjournment a committee of five was appointed, with J. B. Wiles, Manager of the Portsmouth Chamber, as chairman, to work out a practicable plan and report back to the general body.

Mr. Wiles' committee was given authority to add to its number members representing the various agricultural, labor and business interests of the state. It was supposed that the great difficulty in securing any form of relief in the past was that the agricultural interests of the state were wedded to the Smith Law and it was generally believed that the "Corn Stalk Club" would block any proposal which the cities might bring forth. But a few far-seeing optimists did not think so.

Rural Organizations Coöperate

The first meeting of Mr. Wiles' commitmittee proved that the optimists were right. At this meeting, which was held at Columbus June 29, there were in attendance about as many representatives of the Ohio State Grange, the Ohio Farm Bureau and the Ohio Federation of Labor as came especially in the interest of the cities. From the start the representatives from the rural districts showed sympathetic appreciation of the cities' predicament. It was the Pres-

2 Federal 1-½ ton trucks owned and operated by Union High School, Hanford, Cal.

Short hauls, long hauls; live weight, dead weight; rain or shine; winter or summer—the Federal truck for ten years has builded a reputation for dependability.

City and county officials have based their selection of Federal trucks on this dependability. And public officials judge the product they purchase mainly by quality and the record of performance back of the product.

The variety of service given by Federals is as extensive as man's activities are broad. From dump wagons to passenger busses—Federals in different sizes are fitted to the needs of every business, every community.

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Another
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ident of the Ohio State Grange who made the motion for the appointment of a committee to draft a bill to be presented to the next Legislature providing that, pending a general revision of the taxation laws of the state, the present limitation of the tax rate should be modified or entirely lifted for a period of from three to five years to give the needed relief.

This was followed by the adoption of two other motions, one for the appointment of a committee to draft a bill limiting the bonding power of taxation districts, and the other for the appointment of a committee to draft a bill revising the budget system of taxation districts.

Before the general committee adjourned it provided for the appointment of another committee to work out a plan for a State Tax Convention to consider and bring about an agreement providing for a revision of the taxation system of the state.

When their work is finished, these committees will report back to the general committee, and it in turn will report back to the general body composed of representatives of the 32 chambers of commerce. The work is unfinished, but up to the present time the movement has accomplished what seemed to many an impossible task, namely that of bringing to a common agreement the various economic interests of the state on this important taxation problem.

At present there is every reason to believe that all will agree upon a plan which will be formulated into a bill, or series of bills, and that the State Legislature will furnish the cities of the state with the financial relief needed.

To the citizens of Ohio municipalities this movement is of interest because of its immediate practical value. To chambers of commerce and commercial secretaries throughout the country it may be of interest as a bit of organization work that is perhaps unique in chamber of commerce history.

F. P. GOODWIN,
Manager, Department of Civic Affairs, Cincinnati Chamber of Commerce.

THE HOTEL ERECTED IN ASHTABULA, OHIO, BY THE LOCAL CHAMBER OF COMMERCE

Ashtabula's New Hotel a Chamber Project

Ashtabula, Ohio.—July 15 saw the formal opening of Ashtabula's new $350,000 hotel, which was financed through the efforts of the local Chamber of Commerce. The need for a good hotel had long been felt in Ashtabula, but here, as elsewhere, building construction was suspended during the war and the need remained unfilled. In June of 1919, however, the members of the Chamber decided that the time for action had come, and in a short, intensive campaign, the greater part of the stock was subscribed for.

Building operations were begun immediately, and the hotel, a strictly modern fireproof structure with 109 guest rooms, a large ballroom, and all that goes with a first-

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Cities wishing to obtain the most efficient economical and sanitary "Street Cleaning Equipment" should investigate these units.

Ask us for list of Cities using this equipment—there may be one near you.

Municipal Supply Company

South Bend, Indiana

class hostelry, was opened to the traveling public on July 15, 1920.

The entire project was supervised by the Chamber of Commerce. The Secretary of that organization acted as secretary of the hotel building company, and all the bills and pay-rolls were taken care of at the Chamber's offices. The building has been leased to an operating company for a term of twenty years, and the furnishings were provided by that company at a cost of more than $150,000.

ARTHUR F. OTIS,
Assistant Manager, Ashtabula Chamber of Commerce.

The Campaign for Butler's Memorial Hospital a Success

Butler, Pa.—More than three years ago the Butler Chamber of Commerce felt that a new or enlarged hospital was one of the county's greatest needs, and the securing of an adequate county hospital was one of the foremost items on the organization's program of work.

After considerable deliberation, the Board of Directors appointed a representative to confer with the Board of Trustees of the Butler County General Hospital to ascertain if that institution would welcome the assistance of the Chamber of Commerce in securing sufficient funds either to enlarge the present hospital or to build a new one with sufficient facilities to serve properly the hospital needs of the county. The offer was heartily accepted, and the President of the hospital was asked to help the Chamber of Commerce appoint a representative committee to conduct a campaign for raising the necessary funds.

The Hospital Committee was thwarted for three years in its attempt to launch the campaign, first by the pressure of war work and war campaigns, and later, last fall, by the general steel strike. During this time, however, the committee was not idle nor was its work without results, for during these three years a campaign of publicity was so thoroughly carried out that the entire community was well aware of the acute and growing necessity for enlarged hospital facilities.

The early part of June of this year was finally selected by the committee as the date for the campaign. In the meantime, however, the estimated amount necessary had grown from $150,000 to $300,000, because of the increased cost of building, and a half million net was really needed to erect a satisfactory building. In February a mass meeting was called by the Chamber of Commerce, at which time the date and amount to be raised were confirmed and the decision reached that an outside director should be secured to give the benefit of his experience, one against whom there could be no possible local or petty prejudice. A most competent man was secured by the committee.

On June 8 an organization of 400 persons began the active work of securing subscriptions for the new Butler County Hospital. The community had, in the meantime, decided to erect this new institution of mercy as a memorial to its sons and daughters who had sacrificed and suffered to defend it in the hour of peril.

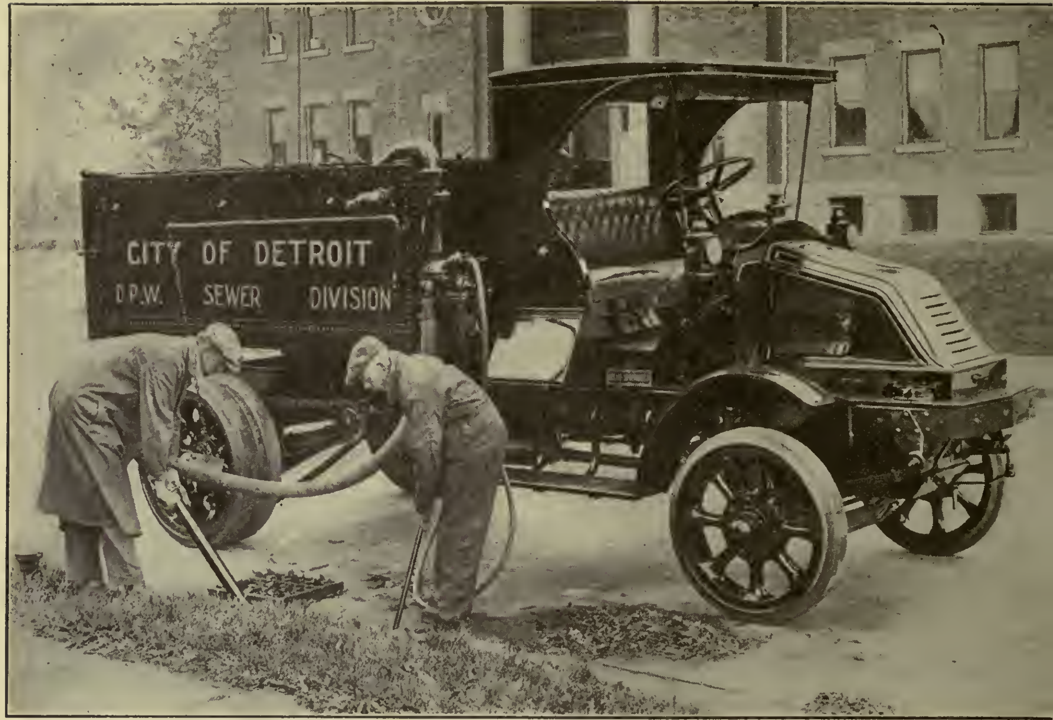
So thoroughly had the need become known and so well was the proposition sold by the workers that when on the ninth day the campaign closed, Butler County had pledged over $526,000 toward the Memorial Hospital, nine-tenths of this amount being pledged by individuals and firms in Butler city and township, with a population of less than 30,000 people.

As a result of this movement, promoted and fostered by the Butler Chamber of Commerce, not only is Butler County now assured of an adequate hospital and a fitting memorial to her sons and daughters who served at home and abroad during the great struggle, but the community, through the pledge of nearly 400 of its most public-spirited workers, is now practically committed to a two-year budget system of intensive campaigns which will save much time, money, and personal effort in the future, as well as assure adequate support for imperative civic and charitable projects.

W. B. MOREY,
Formerly Executive Secretary, Butler Chamber of Commerce, now Board of Commerce.

Chamber of Commerce Day Held Yearly at Seattle Ball Park

Seattle, Wash.—Believing that a baseball team is as much a civic asset as an industrial plant, the Seattle Chamber of Commerce each year holds a Chamber of Commerce Day at the ball park and urges its members to turn out for this yearly mid-season event. In 1919 Seattle had the tail-end club in the Pacific Coast league. It was to prove the city's loyalty to the club that the Chamber of Commerce at that time



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CLEANING sewer catch basins for the City of Detroit,

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In a clean and sanitary manner, safeguarding the health of the City.

Mounted on Special Kelly-Springfield Chassis.

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Write for full information and catalogue

THE SPRINGFIELD ENGINEERING COMPANY
SPRINGFIELD, OHIO

started a "Booster Day" and succeeded in getting 8,000 people out for the week-day game. This year the club stands higher in the race, and the annual Chamber of Commerce Day brought out 9,000. Next year the organization expects to bring the attendance up to 10,000.

Among the special features staged on Chamber of Commerce Day this year were the dropping of a ball by an airplane, and a burlesque show in which the umpire was buried and consigned to the lower regions, from which he emerged spouting fire.

HAROLD CRARY,
Assistant Publicity Director, Seattle Chamber of Commerce.

Chamber Secures Passage of Jitney Ordinance

South Bend, Ind.—As a result of the efforts of the Street Railway Investigation and City Traffic Committee of the South Bend Chamber of Commerce, an ordinance was recently passed prohibiting jitney busses from operating over streets used by the electric street railway. The ordinance, on which the future service of the electric line is conditioned, regulates the jitneys, requires their owners to procure licenses for the operation of their motor vehicles used in the city, and provides for the revocation of the licenses and penalties for the violation thereof.

The ordinance contains fifteen sections and covers the matter thoroughly. Each driver of a jitney must file with the city controller a contract of liability insurance to provide for the payment of any final judgment that may be rendered against the insured for damages to property, or for bodily injury or death to others resulting from accident or from collision through the negligence of the operator.

The license system requires that the operator shall pay an annual fee of $25 for a vehicle having a rated seating capacity of 5 passengers or less; $35 for a vehicle having a rated seating capacity of more than 5 and not more than 7 passengers; $75 for a vehicle having a seating capacity of more than 7 and not over 12 passengers; and $125 for a vehicle having a rated seating capacity of more than 12 passengers.

The ordinance requires that the operator be at least 18 years of age. It also provides that not more than 5 cents shall be charged between the hours of 5 A. M. and 12 midnight. Upon an operator's being convicted twice for the violation of any of the provisions of the ordinance, his license may be revoked by the mayor. The names of the streets over which the busses are not allowed to run are given.

At the third reading of the ordinance more than one hundred business men and manufacturers were present, and twenty-five representative men spoke of the necessity of regulating the jitneys as a means of bettering the street car service. Figures were presented showing that the street railway company had expended thousands of dollars in improvements, including the purchase of new cars, and that the jitneys operating in its territory take from the public $300 to $400 a day that rightfully should go into the coffers of the street railway company in consideration of its investment and the obligation to render continuous and adequate service.

S. N. VAUGHN,
Editor, *South Bend Today*, the official bulletin of the South Bend Chamber of Commerce.

Education in the Growth and Manufacture of Cotton

Houston, Tex.—In an effort to supply information relative to cotton, its growth and uses, the Houston Chamber has sent to several chambers of commerce in the country a circular letter reading in part as follows:

"The principals and pupils of many of our public schools and other educational institutions have written us so frequently for facts concerning the cotton plant that we have planned to make this information available.

"Our purpose is to supply samples of the cotton boll, these to be accompanied by a non-technical elemental treatise, together with a list of the two hundred or more commodities in daily use in the manufacture of which cotton or its by-products are essential.

"We will deem it a favor if you will be so kind as to arrange to secure from the superintendents the names of the principals of your public schools, that we may arrange to supply their classes, if it is found that they wish to avail themselves of this service."

The proposition appears to be of much interest to the organizations to which it was made, and the Houston Chamber of Commerce feels that the educational work that is done as a result of it will be quite valuable in those sections where cotton is not grown.

GARLAND S. BRICKEY,
General Manager, Houston Chamber of Commerce.

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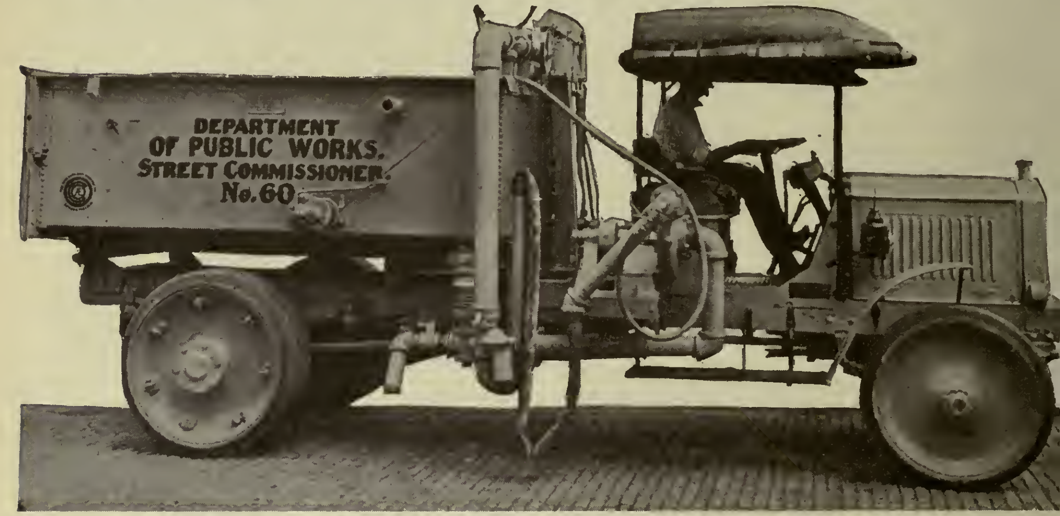
CLEANS CATCH BASINS

Saves Time—Money—Labor



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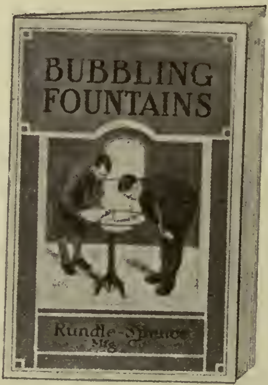

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Ideal for schools, public buildings, parks and streets and factories.

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The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Supreme Court of New York State Holds Health and Sanitation Exhibit Not a Proper "Park Purpose"

A decision of the New York Court of Appeals reverses a recent conclusion reached by the Appellate Division of the Supreme Court of the state concerning the uses to which Central Park may be put. Apart from its relation to this famous park, the decision of the higher court is interesting because of its consideration in general of what constitutes legitimate park purposes.

Specifically, the decision upholds opposition to the leasing of the Arsenal Building in Central Park for use by an institution organized to "study and promote means and methods of safety and sanitation." The reason for the decision appears in the following extracts from the opinion of the Court of Appeals:

"A park is a pleasure ground set apart for recreation of the public, to promote its health and enjoyment. . . . It need not and should not be a mere field or open space, but no objects, however worthy, such as court houses and schoolhouses, which have no connection with park purposes, should be permitted to encroach upon it without legislative authority plainly conferred, even when the dedication to park purposes is made by the public itself and the strict construction of a private grant is not insisted upon. . . .

"Differences naturally arise as to the meaning of the phrase 'park purposes.' Under local statutes it has been held that a public library may be erected in a park without diverting it from such purposes . . . and the city of Hartford was permitted to turn over a part of the land it had dedicated as a public park to the state for the purpose of a State Capitol. . . . Monuments and buildings of architectural pretension which attract the eye and divert the mind of the visitor; floral and horticultural displays, zoological gardens, playing grounds and even restaurants and resthouses and many other common incidents of a pleasure ground contribute to the use and enjoyment of the park.

"The end of all such embellishments and conveniences is substantially the same public good. They facilitate free public means of pleasure, recreation and amusement, and thus provide for the welfare of the community. The environment must be suitable and sightly or the pleasure is abated. Art may aid or supplement nature in completing the attractions offered. The legislative will is that Central Park should be kept open as a public park ought to be, and not be turned over by the Commissioner of Parks to other uses. It must be free from intrusion of every kind which would interfere in any degree with its complete use for this end.

"To promote the safety of mankind and to advance the knowledge of the people in methods of lessening the number of casualties and avoiding the causes of physical suffering and premature death is the purpose of the Safety Institute of America; to provide means of innocent recreation and refreshment for the weary mind and body is the purpose of the system of public parks. The relation of the two purposes is, at best, remote. No reproach is cast upon the humanitarian aims of the Safety Institute when we say that it must find another place in which to bring them to the attention of the public."

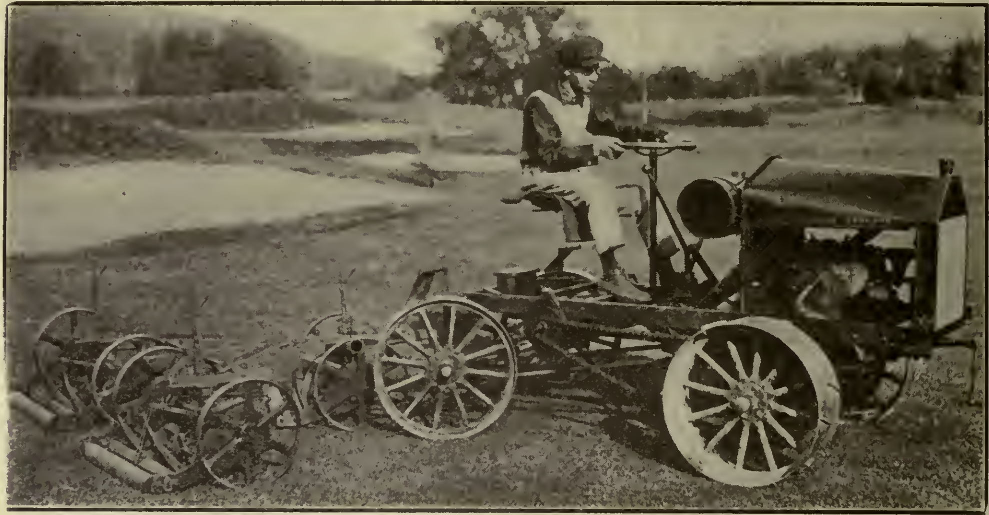
Validity of Ordinance Forbidding Keeping of Hogs and Providing for Summary Seizure and Disposal of Them

Inquiry comes from a city attorney to the Legal Department of THE AMERICAN CITY for citation of court decisions bearing upon the validity of an ordinance of his city virtually purporting to forbid keeping of hogs within the municipal limits, and authorizing summary seizure and disposition of such animals, including those taken up on private land, as well as in streets, etc.

The law has been thus succinctly stated by a standard legal authority:

"Ordinances have been generally sustained which forbid keeping in the corporate limits, or within the 'settled portion of the city,' certain animals, such as hogs, donkeys, stallions and chickens; but some have been held unreasonable and void." (28 Cys. 739.)

Cases supporting the validity of such ordinances are as follows: Smith vs. Collier, 118 Ga. 306, 45 S. E. 417; Commonwealth



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WORTHINGTON MOWER COMPANY
Shawnee-on-Delaware, Pa.

vs. Patch, 97 Mass. 221; Ex Parte Glass, 90 S. W. 1108; Whipple vs. McIntyre, 69 Mo. App. 397, 402; Smith vs. McConathy, 11 Mo. 517; St. Louis vs. Stern, 3 Mo. App. 48, 54; Quincy vs. Kennard, 151 Mass. 563, 24 N. E. 860; Com. vs. Perry, 139 Mass. 198, 29 N. E. 656; Com. vs. Kidder, 107 Mass. 188; State vs. Hord, 122 N. C. 1092; Darlington vs. Ward, 48 S. C. 570.

Limitations upon the regulatory powers of municipalities are, however, laid down in some jurisdictions. For example, the Mississippi Supreme Court said in the case of Comfort vs. City of Kosciusko, 88 Miss. 611, 41 So. 268:

> "The keeping of hogs in a municipality, or the erection of hog pens, may or may not be a nuisance, and it is only when they are such that a municipality has the power to interpose and suppress hog pens or prevent the keeping of hogs in a municipality. An ordinance which provides generally that hogs may not be kept in a municipality, without reference to whether they are or are not a nuisance, is too broad and sweeping in its provisions and cannot be upheld. When the keeping of hogs within a municipality becomes a nuisance, no matter where they may be kept therein, it is not only the power, but it is its duty to abate the same."

On the other hand, the Iowa Supreme Court upheld an ordinance of the city of Cedar Rapids prohibiting hog pens within the city limits, excepting for commercial purposes. (68 Ia. 107, 26 N. W. 33.)

The law is more clearly settled on the point that running at large of swine may be forbidden. (28 Cyc. 739.)

That an ordinance may be annulled for unreasonable failure to provide proper notice and opportunity for hearing to the owner of swine taken up, before selling the same at public auction, is illustrated in the case of Rosebaugh vs. Saffin, 10 Ohio Reports, 31. The Court said:

> "The ordinance commands the marshal to seize and impound the property, and then, without any reserve, without any notice to the party, by means of which he might be enabled to exculpate himself, directs it to be sold, and the net proceeds to be placed in the city treasury. Such an ordinance is as contrary to the spirit of the charter as it is alien from the general genius of our institutions."

And in the case of Crum vs. Bray, 121 Ga. 709, the Georgia Supreme Court said:

> "To the question whether the ordinance amounted to a forfeiture we have devoted considerable time and study. After reading many authorities we have come to the conclusion that the municipal authorities have power to seize and impound animals unlawfully upon the streets and have them sold for the purpose of paying the reasonable cost of feeding and the impounding fee, provided there is sufficient notice given."

Another decision—Hellen vs. Noe, 25 N. C. 493—one handed down by the North Carolina Supreme Court, upheld the validity of a regulation which ordered the taking up of stray hogs and their sale on three days' notice unless redeemed.

In an opinion more fully discussing the authorities and the particular ordinance submitted to us, we have expressed the view that an ordinance authorizing the seizing of swine on private land and sale on brief published and posted notice, without provision for redemption by the owner, would not withstand attack in the courts.

Payment by City to Agent of Manufacturer Ratified by Act of Manufacturer

Where a fire engine manufacturer notified the city to pay for a fire engine directly to him, but billed the engine to an agent, who made the contract so that the city had to pay him to obtain delivery, and thereafter the manufacturer received part of the proceeds from his agent, and gave him credit for his commission, stating to the city that he had made a settlement with the agent, he ratified the payment to the agent and could not thereafter collect any portion of it from the city. (California District Court of Appeal, Gardner vs. City of Glendale, 188 Pacific Reporter 307.)

City Liable in Damages to Party Injured, for Failure to Remove Dangerous Structure

Where a platform was constructed by citizens upon a principal street of a village, for the purpose of holding a public entertainment, and was so defectively constructed as to fall and injure a pedestrian upon the street, it is held that, as the platform had been constructed for several days and a sufficient length of time for the village authorities to be aware of its location and condition, it became the duty of the village authorities to abate it as a nuisance, and, having failed to do so, the village could be held liable for damages for the injury. (Chaney vs. Village of Riverton, 177 N. W., 845.)

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Reasonable Billboard Ordinances

Valid When in Interest of Public Health, Safety or Morals—Invalid When Based Purely on Esthetic Grounds

By A. L. H. Street

MAINTENANCE of billboards on private property cannot be prohibited by ordinance on the ground of offensiveness to the esthetic sense. But they may be the subject of reasonable regulations designed to promote the public health, safety and morals.

It is believed that this is an accurate statement of the general rule on this subject, as determined by the weight of judicial decision.

The courts seem to have been uniform in their conclusion that enhancement of the beauty of municipal scenery is not recognized by the law as sufficient excuse for enacting billboard regulations. The judicial attitude on this phase of the subject is well illustrated by the decision of the Illinois Supreme Court in the case of Haller Sign Works vs. Physical Culture Training School, 249 Ill. 436, 94 N. E. 920, 34 L. R. A. (N. S.) 998, Ann. Cas. 1913D, 959. The law there under consideration provided:

> "It shall be unlawful . . . to erect . . . a structure of any kind. . . within five hundred feet of any public park or boulevard within. . . any city in this state having a population of one hundred thousand or more, for the purpose of placing advertisements of any kind or character thereon, etc."

Noting that the act covered parks and boulevards only, and making other observations, the Court said:

> "These suggestions lead unmistakably to the conclusion that the statute in question is an attempt to exercise the police power purely from esthetic considerations, disassociated entirely from any relation to the public health, morals, comfort, or general welfare. However desirable it may be to encourage an appreciation of the beautiful in art and to cultivate the taste of the people of the state, still it has never been the theory of our government that such matters could properly be enforced by statute when not connected with the safety, comfort, health, morals and material welfare of the people."

The highest court of the land has approved the view that esthetic considerations alone will not support an ordinance restricting the maintenance of billboards. As late as March 24, 1919, and in the case of St. Louis Poster Advertising Co. vs. City of St. Louis, 39 Supreme Court Reporter, 274, that tribunal said of the ordinance there under consideration:

> "Possibly one or two details, especially the requirement of conformity to the building line, have esthetic considerations in view more obviously than anything else. But as the main burdens imposed stand on other ground, we should not be prepared to deny the validity of relatively trifling requirements that did not look to the satisfaction of rudimentary wants that alone we generally recognize as necessary."

A few years ago it seems to have been quite commonly supposed that unless a billboard ordinance had some reasonable tendency to limit fire risks or to avoid blowing over of such advertising structures to the peril of person or property it could not be sustained against attack upon its validity. But this view cannot be said to reflect the law as recognized now. On this point see the further remarks of the United States Supreme Court in the case last cited, wherein the Court upheld the validity of an ordinance of the city of St. Louis containing provisions of which the following is a summary: It allows no billboard of twenty-five square feet or more to be put up without a permit and none to extend more than fourteen feet above the ground. It requires an open space of four feet to be left between the lower edge and the ground, forbids an approach of nearer than six feet to any building or the side of the lot, or nearer than two feet to any other billboard, or than fifteen feet to the street line, and without qualifications requires conformity to the building line. No billboard is to exceed four hundred square feet in area. The fee for a permit is one dollar for every lineal five feet.

In attacking the ordinance, plaintiff represented that its billboards would withstand wind of greater velocity than had ever blown in St. Louis, and that they were so covered by galvanized iron as to exclude all danger from fire. But the Supreme Court said:

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"Of course, the several restrictions that have been mentioned are said to be unreasonable and unconstitutional limitations of the city in the interest of the safety, morality, health and decency of the community.' . . . It is true that according to the bill the plaintiff has done away with dangers from fire and wind, but apart from the question whether those dangers do not remain sufficient to justify the general rule, they are or may be the least of the objections adverted to in the case."

And the Court makes this further important declaration:

"If the city desired to discourage billboards by a high tax we know of nothing to hinder."

Grounds of objections to billboards mentioned by the Missouri Supreme Court in St. Louis Gunning Advertising Company Case included the tendency to facilitate the commission of crime and nuisances in the rear of such structures, especially where the boards are permitted to come close to the ground. And, under such circumstances, it is found that there is a natural menace to the public health. And yet the decision in this case clearly shows that billboards cannot be excluded on mere grounds of unsightliness, and that the municipal power over them ends when considerations of public safety, health, morals, and good government have been met.

Another leading decision on the point that an ordinance limiting the right to maintain billboards on private property must have some relation to the public welfare is to be found in the case of People vs. Hastings, 77 N. Y. Misc. 453, 137 N. Y. S. 186, wherein it was decided by a New York court that an ordinance requiring a billboard to be constructed of metal was void as applied to a situation where a board constructed of wood could constitute no fire menace. Nevertheless the same court said that an ordinance requiring a permit for erection of boards more than five feet high was valid.

In the case of Thomas Cusack Co. vs. City of Chicago, 242 U. S. 526, 37 Sup. Ct. Rep. 190, it was decided by the United States Supreme Court that an ordinance of defendant city was valid which forbade erection of billboards more than twelve square feet in area in any block where one-half of the buildings on both sides of the street were used exclusively for residential purposes, unless a majority of the frontage owners consented in writing.

"To the Memory of Our Hero Dead"

In line with the growing tendency to memorialize both the dead and the living by the establishment of such institutions as will make all life more worth while rather than to perpetuate the memories of men or events by marble shafts and tablets of bronze, is the action of Bryn Mawr, Pa.

Opinion in that town, as in many others where the question of a suitable monument to the martyrs of the World War on land and sea and in the air has been debated, varied widely on the definition of suitability. There were those who advocated the conventional "Soldiers' Monument," to be found in every state in the Union which sought, on both sides of Mason and Dixon's line, to do honor to its hero dead. There were also those who believed that such a memorial should be as much of the spirit as of the physical, and that a center, building, or fund dedicated to the good of all mankind would create a far more enduring and a nobler memorial than a merely material monument. It was the latter interpretation of a memorial that was at length adopted by the little college town in Pennsylvania. Steps are now under way toward the erection of a community center, in which will be housed six of the largest and most influential activities in that section: the American Legion, the Main Line Branch of the Southeastern Pennsylvania Chapter of the American Red Cross, the Main Line Federation of Churches, the Bryn Mawr Hospital Social Service Department, the Bryn Mawr Community Center and the Main Line Citizens' Association (Visiting Nurses). Thus from a common center will radiate all health and community activities of the town, in ever-widening circles of beneficence. Truly a worthy memorial to the souls of those who went forth and returned not.

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how extremely easy it is to spoil in the making what otherwise would be a wonderful road. You may have the right specifications, the proper material and the best machinery available, but carelessness or poor judgment in the mixing or combining the material, in the spreading or in the compressing or rolling may lay the foundation for unlimited trouble.

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Municipal and Civic Publications

SIXTH YEARBOOK OF THE CITY MANAGERS' ASSOCIATION.

Harrison G. Otis, Secretary of the City Managers' Association. The City Managers' Association, New York. 1920. 183 pp. Illustrated.

This volume contains an account of the proceedings of the Sixth Annual Meeting, held in Indianapolis, October, 1919, and a directory of city manager municipalities, corrected to July 1, 1920. A considerable part of the book is devoted to reports on the progress of the manager plan in 185 cities that have adopted it. It contains the significant statement that ''to date, no report is at hand of any city having reverted to its former plan of government after having adopted the manager idea by vote of its citizens.''

REPORT OF THE UNITED STATES HOUSING CORPORATION. Vol. 1.

Published by the United States Department of Labor, Bureau of Industrial Housing and Transportation, Washington, D. C. 1920. X+ 391 pp. Illustrated.

Volume 1 covers the subjects of Organization, Policies, and Transactions undertaken by the Corporation in its war emergency construction for housing war workers. The volume includes detailed appendices describing the activities of the various divisions of the Corporation, such as the Transportation Division, Town Planning Division, Industrial Relations Division, and several others.

STOPS; OR HOW TO PUNCTUATE.

Paul Allardyce. David McKay Company, Philadelphia. 91 pp.

A practical handbook for writers and students, covering the use of all the marks of punctuation. There is a brief but comprehensive section devoted to the correction of printer's proof.

ZONING IN MASSACHUSETTS.

Bulletin No. 6 of the Massachusetts Federation of Planning Boards. July, 1920. 4 pp. Copy of the Massachusetts Zoning Law, with explanation. (Apply to Arthur C. Comey, Secretary, Cambridge, Mass.)

WATER PURIFICATION IN MILWAUKEE.

Report of Experiments on the Purification of the Water Supply of Milwaukee, Wisconsin. By Joseph W. Ellms, Consulting Engineer. 156 pp. Photographs, drawings, maps, tables. (Apply to H. P. Bohmann, Superintendent of Water Works and Water Purification, Milwaukee, Wis.)

INDUSTRIAL EDUCATION.

Report of the Committee on Industrial Education to the National Association of Manufacturers, presented at the twenty-fifth annual meeting of the Association, in New York, May, 1920. 64 pp. Many illustrations. ''Representatives of the occupations must dominate in state boards of vocational education because only men whose lives are spent in industry know when either the opportunities or the needs of industry are met by vocational education.'' (Apply to the Secretary of the National Association of Manufacturers, George S. Boudinot, 30 Church Street, New York, N. Y.

CITY ZONING.

By Robert H. Whitten, Advisor, Cleveland City Plan Commission. Reprinted from the Journal of the Western Society of Engineers, Volume XXV, Number 2, January 20, 1920. 8 pp. Explaining the principles of city zoning and its advantages and showing the need of the zoning of apartment and tenement houses in large cities. (Apply to the Secretary of the Western Society of Engineers, Edgar S. Nethercut, 1735 Monadnock Block, Chicago, Ill.)

A CORRECT PUBLIC POLICY TOWARD THE STREET RAILWAY PROBLEM.

A report of the National Municipal League Committee on Public Utilities in which all previous reports are summarized and the unsolved elements of the problems listed. Published as a supplement to the National Municipal Review, April, 1920. 20 pp. (Address the National Municipal League, North American Building, Philadelphia, Pa.)

A COMPREHENSIVE CITY PLAN FOR EAST ST. LOUIS, ILL.

A quarto of 72 pages profusely illustrated with maps, views and drawings. Prepared for the War Civics Committee of East St. Louis by Harland Bartholomiew. 1920. The plan is presented under the following divisions: A Major Street Plan for East St. Louis; Public Recreation; Transit; Transportation; Zoning; Sewers and Water Supply; Housing; City's Appearance; Legal and Financial Aspects of the City Plan. The Appendix contains proposed ordinances designed to make possible the carrying out of the plan. (Apply to Harland Bartholomew, 1103-4 Chemical Building, St. Louis, Mo.)

MISSOURI HIGHWAYS.

Three pamphlets: ''Laws of Missouri Relating to Roads, Highways and Bridges,'' revised 1919, compiled by John L. Sullivan, Secretary of State, to whom apply for this and the next; ''Motor Vehicle Law of the State of Missouri''; ''Report of John M. Malang, State Highway Superintendent, to State Highway Board,'' for year ending December 31, 1919, to be obtained from the author. (Address both at Jefferson City, Mo.)

THE TRAFFIC ON HIGHWAYS.

Proceedings of the Annual Convention of the National Highway Traffic Association and the Highway Transport Conference of the National Automobile Chamber of Commerce, held on January 29, 1920, in Chicago. 54 pp. (Address the National Automobile Chamber of Commerce, Inc., Marlin-Rockwell Building, Madison Avenue and 46th Street, New York, N. Y.)

TOWN PLANNING IN SOUTH AUSTRALIA.

''Planning and Development of Towns and Cities in South Australia.'' Report by Charles C. Reade, Government Town Planner, to the Attorney-General and Minister in control of Town Planning, upon existing conditions and defects and the need for town planning legislation relating thereto in conformity with the provisions of the Town Planning and Development Bill, 1919. Published 1919. 8½ by 13¼ inches. 48 pp. Views, maps and drawings. (Apply to the Government Town Planner at Adelaide, South Australia.)

A PARK SYSTEM FOR OTTUMWA, IOWA.

Prepared under the direction of the Ottumwa Park Board by Leonidas Willing Ramsey, Landscape Architect, Davenport, Iowa. 1920. Presenting specific recommendations for the parks for which plans have been made, and treating in a general way the park problems, park needs and such city planning problems as are involved in the consideration of the park system for Ottumwa. 47 pp. Maps, views, drawings. (Apply to Mr. Ramsey.)

THE TORONTO SCHOOLS.

''The Physical Plant of the Toronto Public Schools'' and ''The Building Department of the Toronto Board of Education,'' two interim reports on phases of the business administration of the schools of Toronto, prepared by the Toronto Bureau of Municipal Research in its study of the educational needs and resources of the city. June, 1920. 87 pp. Diagrams and tables. (Apply to the Bureau, 189½ Church Street, Toronto, Ont.)

SOURCES OF INFORMATION ON PLAY AND RECREATION.

Revised and Enlarged Edition, 1920. By Howard R. Knight and Marguerita P. Williams. Published by the Department of Recreation of the Russell Sage Foundation, 130 East Twenty-Second Street, New York City. A condensed but comprehensive list of what has been written about recreation. The arrangement is by subjects, with annotations on many of the publications, some of which deal with other phases of recreation than the subject under which they are listed. A list of publishers with addresses is printed at the end of the bibliography to facilitate ordering in case the publications desired are not available in the local public library.

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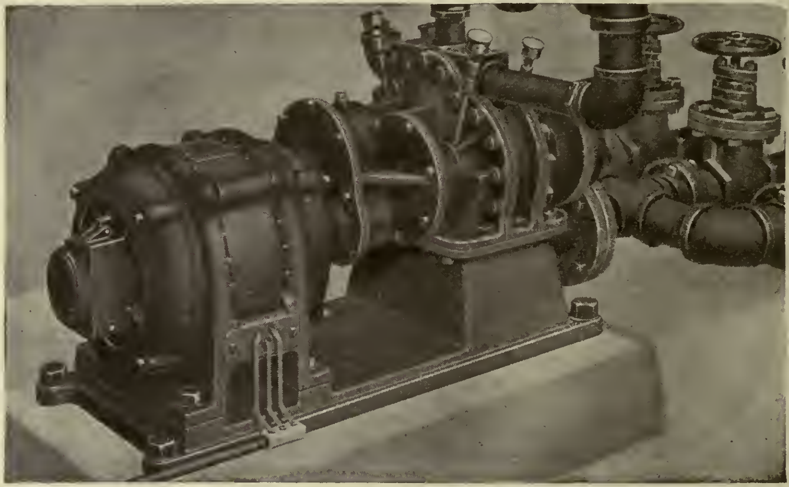

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PROCEEDINGS OF THE UNION OF NOVA SCOTIA MUNICIPALITIES.

A report of the Fourteenth Annual Convention, held at Yarmouth, N. S., August 27-29, 1919. 172 + iv pp. Illustrated. (Apply to the Secretary of the Union, Arthur Roberts, Town Solicitor, Bridgewater, N. S.)

MOTION PICTURES.

"Laws, Ordinances and Regulations on Censorship, Minors and Other Related Subjects" By Lucius H. Cannon, Librarian, Municipal Reference Library, St. Louis, Mo., with list of books by Melitta Dies Peschke. A monthly Bulletin of the St. Louis Public Library. 49 pp. June, 1920.

CHILD HEALTH PROGRAM.

A 16-page illustrated pamphlet prepared by the U. S. Bureau of Education, 1920, for Parent-Teacher Associations and Women's Clubs that wish to guide the health program of their local schools. It covers the following topics: Teaching Health in Our Schools; School Lunches; Nutritional Classes; Correction of Physical Defects; Recreation; Our Teachers' Health; School Sanitation; Good Housekeeping in the Schools; Strategy and Publicity in Community Health Work. (Apply to the U. S. Bureau of Education, Washington, D. C., for Health Education Bulletin No. 5.)

THE PALISADES INTERSTATE PARK.

The Twentieth Annual Report of the Commissioners, published as Legislative Document No. 100, State of New York. 1920. 23 pp. and map. A general description of the park project, and a detailed account of the work accomplished during the year 1919. (Apply to J. DuPratt White, Secretary, 90 Wall Street, New York City.)

HEALTH REPORT OF MASSACHUSETTS.

The Fifth Annual Report of the Commissioner of Health of Massachusetts, reprinted from the Fifth Annual Report of the Massachusetts State Department of Health. 34 pp. An account of the activities of the Department during 1919, with a brief description of the lecture service maintained. In all, 571 lectures were given by the Department to aggregate audience of over 100,000 persons. (Apply to Eugene R. Kelly, M. D., Commissioner of Health, Boston, Mass.)

HEALTH REPORT OF MICHIGAN.

Forty-seventh Annual Report of the Commissioner of the Michigan Department of Health, for the fiscal year ending June 30, 1919. The graphic charts showing the prevalence of various diseases over a period of years add to the value of this report. (Apply to R. M. Olin, M. D., State Health Commissioner, Lansing, Mich.)

CIVIC EDUCATION.

Under the title "Civic Training in Service," Teachers' Leaflet No. 8. June, 1920. Bureau of Education, Department of the Interior. (Apply to the Bureau.)

THE SCHOOL AND THE MEMORIAL COMMUNITY HOUSE.

Bulletin No. 11, of the series on Community Buildings as War Memorials. A concise but detailed account of the possibilities of the uses of combined schools and community houses. The discussion of the rural community's schoolhouse will be helpful to those interested in rural school consolidation. Published by the Bureau of Memorial Buildings of the War Camp Community Service, 1 Madison Ave., New York, N Y. 1920. 27 pp. Illustrated.

TORONTO'S CHILDREN.

"Toronto's Children Are Her Greatest Asset." Triple folder issued by the Bureau of Municipal Research, 189½ Church Street, Toronto, Ontario, May 5, 1920. A summary of findings and suggestions from the Bureau's survey of the educational needs and resources of the city. (Apply to the Bureau, as above.)

NATIONAL ASSOCIATION FOR THE ADVANCEMENT OF COLORED PEOPLE.

Tenth Annual Report of the Association for the year 1919. "A Summary of Work and an Accounting." 103 pp. (Apply to the Association, at 70 Fifth Avenue, New York City.)

RURAL HEALTH.

Proceedings of the Second National Country Life Conference, Chicago, 1919. Published by the American Country Life Association. 242 pp. Illustrated. (Apply to Charles J. Galpin, Executive Secretary, Washington, D. C.)

THE FUTURE OF TOWN PLANNING.

A paper by Viscount Astor read at the Meeting of the Town-Planning Institute, June 25, 1920, with the discussion at that meeting. Published by the Town-Planning Institute. 23 pp. (Apply to the Institute. 4 Arundel Street, London, W. C., England.)

THE HOUSING CRISIS.

A memorandum prepared for the Special Session of the New York Legislature, by the City of New York. 13 pp. September, 1920. (Apply to the City Club, 55 West 44th Street, New York City.)

MUNICIPAL PROBLEMS IN BALTIMORE.

Report of the Committee on Municipal Problems appointed by the Merchants and Manufacturers Association of Baltimore. 1920. 63 pp. The report discusses at length such questions as municipal taxation, harbor development, fire prevention and waste, public health and education. (Apply to William H. Maltbie, Chairman.)

TYPHOID REDUCTION IN SOUTH CAROLINA.

Comparative results in counties with and without health organizations. L. A. Riser, M.D., Director, County Health Work, South Carolina State Board of Health. 7 pp. Graphic evidence of the value of county health organizations. (Apply to L. A. Riser, Columbia, S. C.)

TIMBER DEPLETION.

Timber Depletion and the Answer. A Summary of the Report on Timber Depletion and Related Subjects, Prepared in Response to Senate Resolution 311. United States Department of Agriculture Department Circular 112. William B. Greeley, Forester. 15 pp. Discussion of existing condition and proposals for a national forestry policy. (Apply to William B. Greely, Forester, Forest Service, U. S. Department of Agriculture, Washington, D. C.)

TORONTO CITY BUDGET.

City Budget Facts, based upon the official estimates of the city of Toronto, 1920, together with a discussion of the public service enterprises of Toronto. Part 1. The Budget Proper. 16 pp. Charts and diagrams. (Apply to John MacDonald, President, Bureau of Municipal Research, 189½ Church Street, Toronto, Ont.)

Municipal Reports

Andover, Mass.—Twentieth Annual Report of the Board of Public Works of the Town of Andover, embracing the Thirty-First Annual Report of the Water Commissioners and the Twenty-Third Annual Report of the Sewer Commissioners for the year ending December 31, 1919. (Apply to F. L. Cole, Superintendent, Board of Public Works.)

Milton, Mass.—Eighteenth Annual Report of the Water Commissioners of Milton, Mass., for the year 1919. (Apply to Marcy L. Sperry, Chairman.).

Newark, N. J.—Annual Report of the Department of Health, Newark, N. J., for the year ending Dec. 31, 1919. (Apply to Charles V. Craster, M. D., Health Officer.)

New York, N. Y.—Fourteenth Annual Report of the Board of Water Supply of the City of New York, accompanied by the Report of the Chief Engineer. Jan. 1, 1920. (Apply to John F. Galvin, President of the Board.)

St. Louis, Mo.—Annual Report of the Division of Parks and Recreation of the Department of Public Welfare of St. Louis. For the fiscal year ending April, 1920. Illustrated. (Apply to Fred W. Pape, Commissioner of Parks and Recreation.)

St. Paul, Minn.—Thirty-eighth Annual Report of the Board of Water Commissioners for 1919. (Apply to J. I. Faricy, City Clerk.)

Syracuse, N. Y.—Second Annual Report of the Department of Parks. 1919. (Apply to F. M. Westcott, Commissioner.)

Tacoma, Wash.—Annual Report of City Controller. 1919. (Apply to J. M. Roberts, City Controller.)

Washington, D. C.—Report of the Woman's Bureau of the Metropolitan Police, District of Columbia. For 1919. (Apply to Mina C. Van Winkle, Director.)

Estimates of Cost of Proposed Work
Reports on New Improvements
Preparation of Plans
Supervision of Construction

Dams and Reservoirs
Pipe Lines
Filtration Plants
New Water Supply Systems

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News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Importance of Metering Water at the Pumps

Recent extensive and systematic investigation by The American City has shown that in spite of the important advances made by municipalities in water works operation, many water works officials apparently do not appreciate the importance of metering water at the pumps.

In the case of pumps of the reciprocating type this is probably due to one or two rather prevalent fallacies. Many engineers believe that pump "slip" is always accompanied by noise, and if there is no noise present they conclude that the pump is operating at rated efficiency. Experience has shown, however, that often this is not the case. If the "slip" is due to a small number of badly worn valves a noise can easily be detected, but if the "slip" is due to a large number of slightly worn valves, the noise will be inaudible.

Sometimes engineers also attempt to test for "slip" by opening the hand holes underneath the valve decks and by allowing the full water pressure to be exerted upon the top of the valves. When they find only a small amount of leakage they draw the erroneous conclusion that the "slip" at this point is negligible. This does not follow, because much of the "slip" occurs while the valves are in the act of descending, and in modern pumping engines the valves are in the act of descending a large proportion of each revolution. Because of the sudden and frequent reversals of water pressures in up-to-date pumping units, rubber valves are rather quickly worn on the under side. The valve touches its seat around the outer circumference, around the central hole and also upon the radial ribs. Depressions, frequently ⅛-inch deep, are worn in the rubber, and when the valve happens to turn around to a new position the raised spots come in contact with the ribs. Perfect seating is therefore an impossibility, and excessive leakage, or "slip," occurs during the closing and during the reversal stroke of the pump plunger.

In connection with the performance of centrifugal pumps, engineers are also often too prone to rely solely on the maintenance of the theoretical discharge. Here again experience has shown that this cannot be depended upon. The actual performance of the pump may be much poorer initially than its designers anticipated. Then too, after brief periods of service the vanes or impellers become "cut" by gritty or acid-bearing water, or even clogged, bent or broken by sticks, twigs, fish or debris carried by the swiftly moving column of water.

A RECORDING METER FOR PUMPING STATIONS

To be absolutely sure of the efficiency of a pumping unit, whether reciprocal or centrifugal, a reliable checking device must be used constantly, and for this service the venturi meter is standard equipment. Many pump manufacturers employ them to determine the actual performance of pumps before shipment, and in new plants it is almost universally specified as a part of the station equipment.

The Builders Iron Foundry, Providence, R. I., makes venturi meters for use with a pumping unit. A manometer, which reads directly in gallons per minute or other desired units, is used. Usually, however, a register-indicator-recorder is selected for this purpose. In addition to indicating the momentary rate of flow it registers the total flow and records continuously on a circular chart the rate of flow over a period of 24 hours. Sometimes the indicator dial has a second set of graduations corresponding to the pump speed, so that the percentage of pump slip can be quickly determined by comparing the actual number of revolutions per minute of the pump with the indication on the dial. For instance, the pump may be running at exactly 25 revolutions per minute and the indication on this dial may be 23; the "slip" would therefore be 8 per cent.

New Rochester Consulting Engineer

Announcement has just been received that James W. Routh, Director and Chief Engineer of the Rochester Bureau of Municipal Research, has opened offices at 501 Arlington Building, Rochester, N. Y., where he will be available as a consulting municipal engineer

A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

Missoula, Montana, is one progressive western city utilizing "ELRECO" Combination Railway and Lighting Poles, which makes separate Lamp Standards unnecessary.

The "ELRECO" Steel Poles support ornamental lighting brackets with modern General Electric Lighting units; also, the span and service wires of the Railway and Lighting Company; keep the streets free and unobstructed from extra Lamp Standards, wooden poles, and a multiplicity of wires, etc.

The usual practice of financing such an installation is to divide the cost between the local Street Railway and Lighting Company, Merchants and the City, making the cost of "WHITE WAY" very reasonable.

What other progressive cities have accomplished is well illustrated in our handsome Catalog "F", sent on request to those interested.

Electric Railway Equipment Company

CINCINNATI, OHIO.

New York Office — 30 Church Street

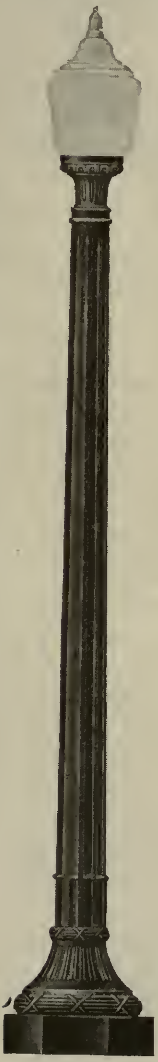
prepared to conduct investigations, to make plans, specifications and reports and supervise operations in connection with all municipal engineering activities.

Two Styles of Street Lighting Standards

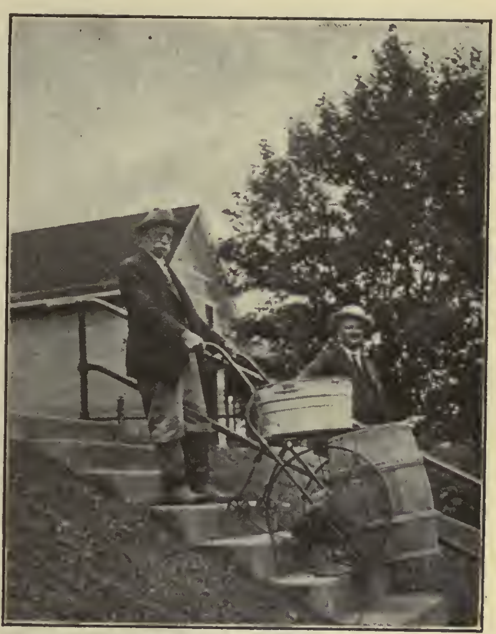
The recent installation of a White Way street lighting system in St. James, Minn., includes many interesting features. The lights are staggered throughout the system and in the business section they are placed 90 feet center to center, while in the residential section they are about 106 feet center to center. The corner lights, of which there are four for each downtown corner and two for corners in residential districts, are placed 15 feet back from the property line so as to conform with the spacing through the blocks.

The lights are operated on two separate circuits, one of which is turned off at midnight, and the other left on all night. All the lights are connected with the former or midnight circuit except two diagonal lights on each street intersection which burn all night. Two styles of light standards are used. The large standards, 12 feet high, are one-light posts, made by King Manufacturing Co., 53 W. Jackson Boulevard, Chicago, Ill., equipped with General Electric Novalux units having white glass diffusing tops and glass canopy tops, and the smaller standards, 10 feet high, are a different style of King post, equipped with another type of Novalux top. About 122 of the large standards are installed downtown, and in the outlying part of the city 10 of the small ones were used. The posts are all set in concrete footings 24 inches square by 3 feet deep, and are fastened by means of four bolts, imbedded in the concrete. In the base of each post is placed a Cutter disconnecting pothead for making the connection between the ground cables and the interior wiring of the post. Each of the standards is equipped with a 6.6 ampere series Mazda C lamp of 400 or 250 candle power each.

This installation was described in detail in the April, 1920, issue of The American City, pages 379-380.



LIGHTING STANDARD, ST. JAMES, MINN.



AN EASY WAY OF CARRYING A RUBBISH BARREL DOWN A FLIGHT OF STEPS

A Handy Barrel Carrier

The very convenient barrel carrier illustrated herewith has been invented by a member of the Department of Public Works, Rochester, N. Y. This carrier is designed to do away with many ash collection difficulties and is of distinct advantage in hilly cities where ashes have to be carried up or down flights of steps. Its advantages are ease of loading and propulsion, less noise and less spilling of ashes. The large wheels move easily in mud, snow and over bumps or curves. It speeds up the collection without fatigue and in this way saves at least 25 per cent in labor cost. Barrel carriers of this type are appreciated by householders, officials and collectors.

The machine, as manufactured by John T. Lynch, 907 Dewey Avenue, Rochester, N. Y., has either one or two small wheels in the rear. The particular benefit of the two small wheels is that it secures a better balance for moving heavily loaded barrels up a flight of steps. In cases where this is necessary the two small wheels make a double fulcrum, while the machine with one small wheel is more compact and is excellent where only empty barrels or lighter loads have to be taken up steps. The Y-rod at the top is very convenient for holding additional tubs or bundles of waste material without an appreciably greater exertion. This Y-rod has a double hook at the end, which drops over the edge of the barrel being carried and prevents its falling off the machine during transportation. The large, broad tread wheels make it easy to use the carrier on steps, soft ground and snow where traction is poor.

King Lighting & Trolley Pole

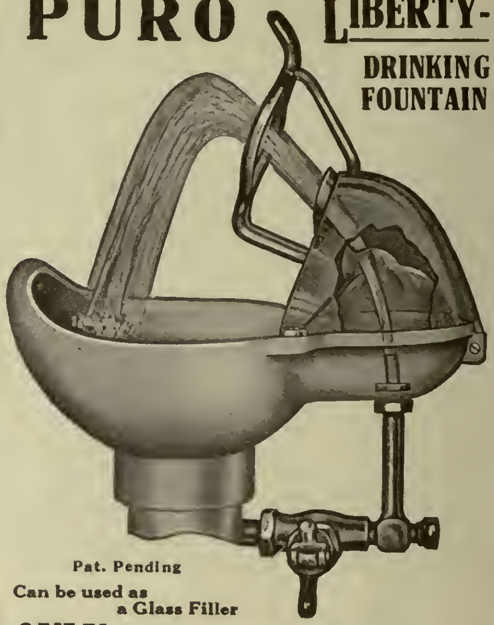
We are prepared to furnish complete combination lighting & trolley pole equipment including brackets & Novalux units

To those interested in modern & economical street lighting, we will send our illustrated booklet Send your name and address.

KING MFG. CO.

53 W. Jackson Blvd., Chicago, Ill.

PURO LIBERTY-DRINKING FOUNTAIN



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Can be used as a Glass Filler

ONLY Sanitary Drinking Fountain

PURO SANITARY DRINKING FOUNTAIN CO.

Haydenville Mass.

No matter WHAT drinking fountain you may put

INDOORS

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IS THE ONLY ONE THAT IS SAFE TO INSTAL **OUTDOORS** BECAUSE it is the only drinking fountain made that was designed and is built **solely** for outdoor use. It does not have to be turned off at the approach of cold weather.

THE ONLY FOUNTAIN MADE THAT IS STRONG ENOUGH TO WITHSTAND PUBLIC ABUSE.

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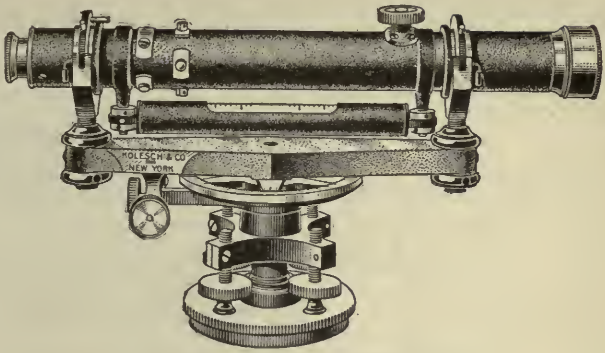
FIRE HYDRANTS
YARD HYDRANTS
HOSE BOXES

CINCINNATI, - - - - - OHIO
Builders of Water Service devices since 1853

A Handy Level for Municipal Work


A LEVEL FOR ALL-ROUND USE

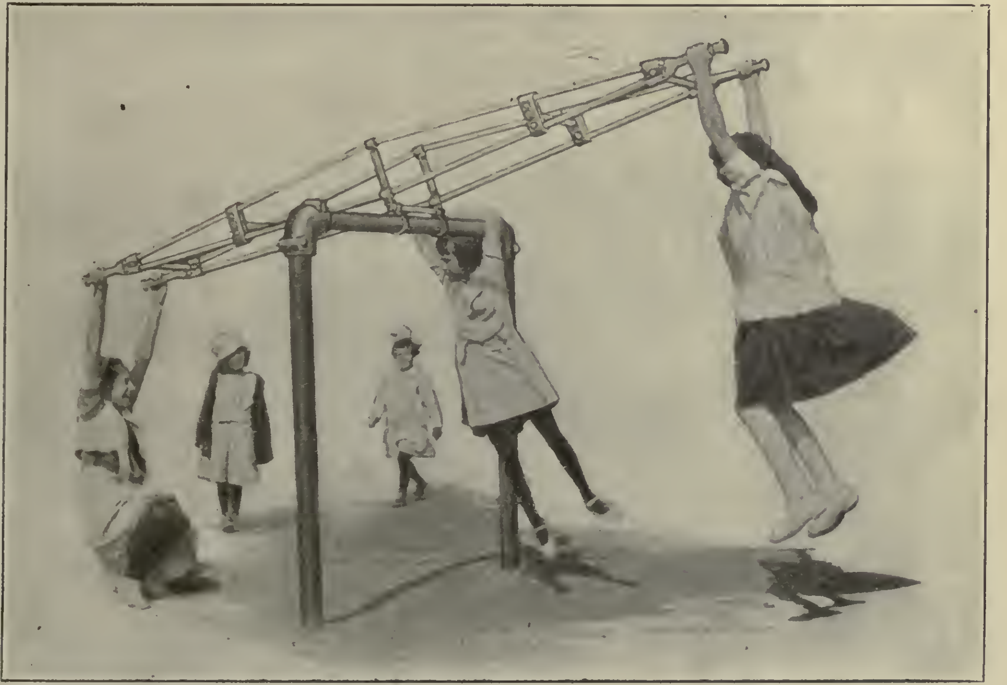
The accompanying illustration shows a level designed especially for the use of builders, architects and contractors for leveling and plumbing walls, giving levels for buildings, laying out angles, grading streets, sewers, drains, etc. The instrument as manufactured by Kolesch & Company, 138 Fulton Street, New York City, consists of a telescope about 12 inches long with a magnifying power of 19 diameters. The lenses are of domestic make with a 1⅛-inch objective. The level carries a dust cap and sun shade and a rack and pinion movement to the objective. The eye piece is adjustable for focusing the cross hairs, and the fine bubble which is attached to the telescope and graduated on the glass, has a sensitiveness of 60 seconds. There is an improved device for locking the clips in the Y's to prevent any trouble from slipping of the telescope. The horizontal circle of three inches is divided into degrees, reading by a vernier to 5 minutes. This circle is held in place by a friction clutch and can be set at zero at any given point. The level is also provided with four leveling arms and is well finished.

A Spanish Water-Works Booklet

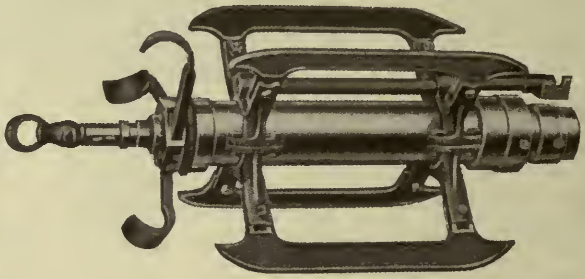
In order to properly take care of the growing business in chlorinators in Central and South America, Wallace and Tiernan Company, Inc., 349 Broadway, New York City, have issued a new booklet describing their apparatus in Spanish, bearing the title "Depuración de las Aguas Potables con Cloro Liquido."

New Activities of Professor Blanchard

Arthur H. Blanchard, formerly of New York City, and now Professor of Highway Engineering and Highway Transport at the University of Michigan, Ann Arbor, Mich., has recently been appointed Consulting Engineer to the Michigan State Highway Department.


Photograph by Everwear Manufacturing Co., Springfield, Ohio

A NEW TYPE OF SEESAW WITH REINFORCED BEAM FOR PLAYGROUND USE



Turbine Sewer Machine

The Turbine sewer cleaning machine will take care of any sized job in a satisfactory manner.....It cleans sewers of every obstruction...

Used with great success by scores of other cities all over the country

Let us demonstrate this machine without any obligation whatever

Write for illustrated book of facts

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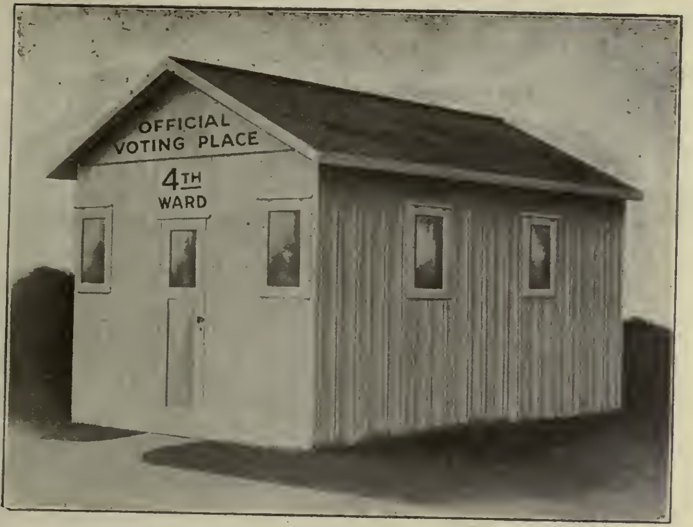
195 ELEVENTH ST., MILWAUKEE, WIS.



A PORTABLE VOTING BOOTH FOR MUNICIPALITIES

Buildings for Voting Purposes

Owing to the shortage of housing facilities and other sundry causes, it has been found difficult in many localities to provide suitable buildings for election purposes.

The solution to this ofttimes perplexing problem has been found in a standardized, portable steel building recently placed on the market by a large steel building manufacturer. The advantageous feature of this building is its portability—its standardized design permits quick dismantling with ordinary labor and transportation to another locality in either a wagon or a truck. This feature is especially desirable because of ever-changing voting places in different precincts.

This building is made of steel throughout; the structural framework, the galvanized sidings, steel window frames and sashes, and kalsomined doors give rigid and durable construction, which means almost the entire elimination of maintenance expense. When not in use, these buildings could serve as storage facilities for country road building equipment.

The Blaw-Knox Company of Pittsburgh, is placing this building on the market.

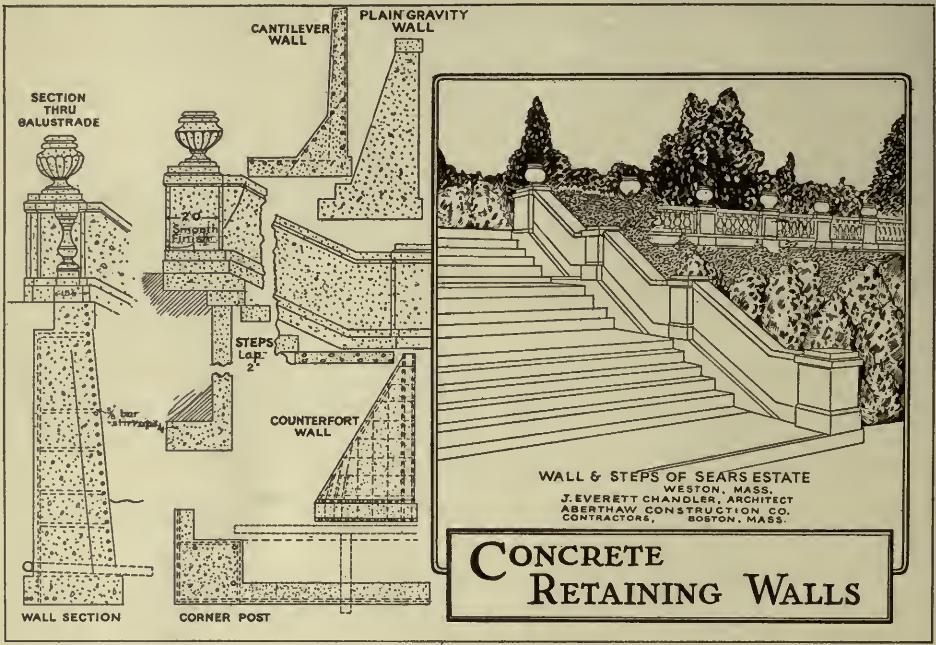
The Municipal Uses of Explosives

In the course of municipal construction work explosives are often called upon to play an important and ever-increasing part. Drainage operations are greatly facilitated through the use of propagated blasts of properly selected explosives; sewer and water main trenches in rock are necessarily dug by the use of dynamite; buildings which have entirely outlived their usefulness and have no junk value are quickly demolished through the use of dynamite. In time of conflagration where nothing short of lack of material to burn will stop the fire fiend on its way, explosives are used to raze buildings in order that the debris may be readily wet down with fire streams and the conflagration checked. These are but a few of the many uses to which Red Cross dynamite and the other brands of explosives manufactured by the E. I. Dupont de Nemours & Company, Inc., Explosive Division, Wilmington, Del., are put.

This company maintains dynamite mills, black powder mills and distributing magazines throughout the length and breadth of the United States so that at all times explosives are available to municipalities and others for immediate service. The accompanying illustration shows workmen preparing charges of dynamite for shattering a huge ledge which lay in the way of a highway development.

PREPARING BLAST HOLES FOR THE REMOVAL OF A LEDGE ALONG THE LINE OF A PROPOSED HIGHWAY

Get these Practical ALPHA service sheets on Concrete Construction



WALL & STEPS OF SEARS ESTATE
WESTON, MASS.
J. EVERETT CHANDLER, ARCHITECT
ABERTHAW CONSTRUCTION CO.
CONTRACTORS, BOSTON, MASS.

CONCRETE RETAINING WALLS

The above illustrations give an idea of the practical suggestions offered by the ALPHA Blueprint Service Sheets and Special Bulletins, which cover the following concrete improvements:

- Workingmen's Homes
- Walkways and Driveways
- Concrete Roads
- Bridges and Culverts
- Foundation and Hatchway
- Gutter and Curb
- Storage Cellar
- Small Warehouses
- Spring House
- Small Dam
- Milk House
- Ice House
- Manure Pit
- Septic Tank
- Oil Storage Tank
- Tennis Court
- Inclosure Walls
- Barn and Silo
- Corn Crib
- Storage House
- Smoke House
- Hog House
- Poultry House
- Dripping Vat
- Tanks and Troughs
- Piers for Small Boats
- Garden Furniture
- Greenhouse
- Coal Pocket
- Post and Walls
- Walls, Sills and Lintels
- Garages and Runways
- Overcoating of Old Dwelling
- Porch, Cellar and Stable Floors

Ask for the sheet or Bulletin that interests you most. A copy of our Handbook, ALPHA CEMENT—HOW TO USE IT—96 pages, illustrated—will also be sent free on request if you live East of the Mississippi. We are obliged to ask inquirers out of our sales field to send fifty cents to cover the printing and mailing expense of this literature. Mention American City.

ALPHPA PORTLAND CEMENT COMPANY, General Offices, EASTON, PA.

Branch Offices: **New York Boston Philadelphia Pittsburgh Baltimore Savannah**

Concrete for Permanence

BOX-BARBERRY BORDERED FORMAL GARDEN

Box-Barberry for Low Hedges

It is by making use of the occasional horticultural happening, or by deliberate breeding, that our wealth of trees and plants, useful either for their fruit or their beauty, is increased. Japan has added materially to the hardy trees and plants in general use throughout our country. Perhaps one of the most universally useful shrubs from that country is the Japanese barberry (Berberis Thumbergi). It is not only graceful and beautiful, but free from insect troubles, extremely hardy, and disposed to thrive under a great variety of soils and climatic conditions. When in doubt as to what to plant, one can safely plant Japanese barberry.

At the nurseries of the Elm City Nursery Company, New Haven Conn., some twenty years ago, among a batch of many thousand seedlings, one was noticed which was very compact and upright in its habit of growth, with small and narrow leaves. This seed variation being in such marked contrast to the general run of Japanese barberry seedlings, the little plant was removed to a place where its habit could be more carefully studied. Within five years the plant had developed into a ball-like little shrub some 3 feet high, and since then has kept on growing, though very slowly, till now the original plant is about 4½ feet tall, still maintaining its ball-like habit. So interesting a variation from the normal type did this new seedling (Box-Barberry) prove to be, that the nursery on whose grounds it first appeared propagated a few hundred for experimental purposes. It was not until this batch of cuttings were put out in a nursery row where they formed a continuous line, that its value as a low border and low hedge was thought of. As the little plants grew in a continuous line, it was apparent to all who saw them that this barberry with its distinct upright habit had unquestionable merit.

It was not, however, until within the last five years that enough stock of it was propagated to warrant sending out plants to the various experiment stations and public parks so that it could be given a general trying out as to its hardiness and adaptability to various conditions of soil and climate. In the meantime the nursery holding the original stock decided to introduce it to the general public, and under the name of Box-Barberry most of the readers of The American City, through recent publicity, are undoubtedly familiar with it by name, if not by actual experience with the plant itself.

Recent Contracts for Warrenite Bitulithic Pavement

Warren Brothers, Boston, Mass., have recently announced a number of awards for Warrenite and bitulithic pavement throughout the west. A contract was awarded to the Moran Paving Company for 77,840 square yards partly on a dense bituminous base and partly resurfacing old macadam in Ogden, Utah. In Dallas, Texas, the Texas Bitulithic Company received a contract for 59,765 square yards of pavement on a concrete base. Clark & Henery have a contract for 7,778 square yards of pavement in Gridley, Cal., on 4-inch Portland cement base. In Kingsbury Cal., a contract was received by the California Road and Street Improvement Company for 50,167 square yards pavement on 4-inch asphaltic concrete. Similar contracts for amounts varying from 334 square yards to 119,000 square yards have been awarded also in the West.

Rapid Economical Construction

IN planning the many homes required to solve the housing problem of Sun Village, Chester, Pennsylvania, rapidity of construction and economical methods were necessarily governing factors—not sacrificing, of course, good building principles.

For the structural material, Hollow Building Tile, made in large units of enduring burned clay with two or more air cells, offered every quality that was desired. It could be handled easily and rapidly because of the large shapes, and laid at a low material and labor cost. The permanent character of the non-combustible material meant the minimizing of repair and upkeep expenses. The air cells afforded comfortable, healthful homes by insulating against dampness, and against the cold of winter and the heat of summer.

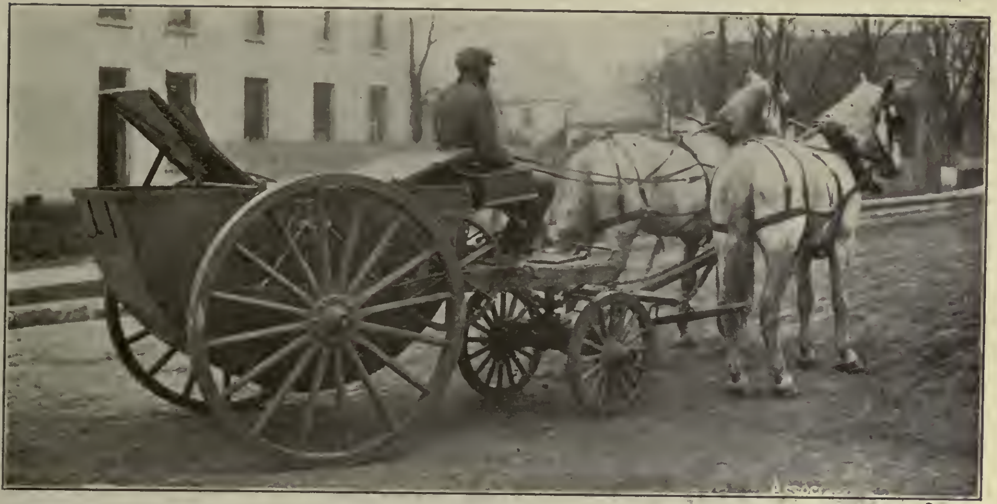
HOLLOW TILE

The Most Economical Form of Permanent Construction

Hollow Tile was deemed the most satisfactory material from every standpoint, and was used exclusively as a structural material. Whether erecting one or a group of structures, Hollow Tile will prove the most logical material to use.

City officials interested in building ordinance work can secure copies for reference purposes of a Standard Code on Hollow Tile construction by writing to the Association, Department 2410.

THE HOLLOW BUILDING TILE ASSOCIATION
REPRESENTING AMERICA'S LEADING MANUFACTURERS
CONWAY BUILDING, CHICAGO



THERE IS NOTHING SLOPPY ABOUT THIS WATER-TIGHT GARBAGE COLLECTION WAGON

The Odorless Removal of Garbage

The accompanying illustration shows a very efficient garbage wagon built by Geo. H. Holzbog & Bro., Jeffersonville, Ind., and used by cities and towns throughout this and foreign countries. The body is made of steel with closely fitting lids which prevent the escaping of obnoxious odors and the leaking of contents. For the hauling of liquid or semi-liquid materials, such as slops, sewage, night soil, etc., the wagon is ideal. The body, hanging low makes the loading easy, and it is also easy to dump. At the close of day it is a very simple matter to thoroughly clean the wagon by flushing with the hose. It can be used as a trailer if desired, by changing the pole.

This is a very strong, durable wagon, neat and attractive in appearance, and will prove a valuable addition to the garbage equipment of any up-to-date community. It may be had in 37-, 54- or 65-cubic foot capacity size. The same firm also builds two-wheel carts of a similar pattern.

New Personnel With Morris Knowles, Ltd.

J. Clark Keith formerly engineer in charge of design and construction for the municipality of Moose Jaw, Sask., now of Morris Knowles, Ltd., of Windsor, Ont., has been appointed assistant chief engineer of the Essex Border Utilities Commission, having jurisdiction over the water supply, sewerage and park systems of the seven municipalities bordering on the Detroit River. Charles E. Henderson, manager of the Windsor, Ont., branch of Morris Knowles, Ltd., has been appointed division engineer in charge of the Detroit office of Morris Knowles, Inc. Mr. Henderson was at one time assistant city engineer of Port Arthur, Ont., later going to St. Augustine, Fla., as city engineer.

There's Cold Weather Ahead for Your Policemen

Policemen are human being in spite of their attitude toward those who have unintentionally done wrong, and cities may well think to look ahead and care for the comfort of the police force, during the winter. There are many stationary posts where policemen, particularly those directing traffic, are called upon to stand in the wet and slush during the winter at street corners. Some cities provide slightly elevated wooden platforms which at least keep the traffic policemen out of standing water, but in cold weather when slush falls repeatedly, the policeman who is not called upon to move about very much suffers greatly from the cold penetrating his damp shoes and numbing his feet. The Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., has devised an electric foot-warming device which can be placed at the crosswalk where a policeman is called upon to stand, and is elevated sufficiently to keep it out of ordinary depths of standing water. The current for this device may readily be brough from an overhead wire, and the foot-warmer is kept at a moderate temperature, sufficient to keep the policeman's feet warm and make him a most congenial officer.

WARM FEET ARE CONDUCIVE TO HAPPINESS

121,322,820 less tons of soft coal were mined last year than in 1918—consumers' stocks are low and the demand keen.

G-E Indicating, Recording Integrating Flow Meter

Get More from your Coal Pile

You can't afford to waste coal and must therefore employ means of securing maximum results from every ton.

Results obtained in many boiler plants show a gain of from 10 to 30% efficiency by the aid of

G-E Steam Flow Meters

These meters are manufactured for the measurement of water, oil and gas as well as for steam.

G-E Flow Meter specialists will gladly assist you in determining the best equipment for your condition.

Write for our booklet
"A Guide to Boiler Economy"

General Electric Company

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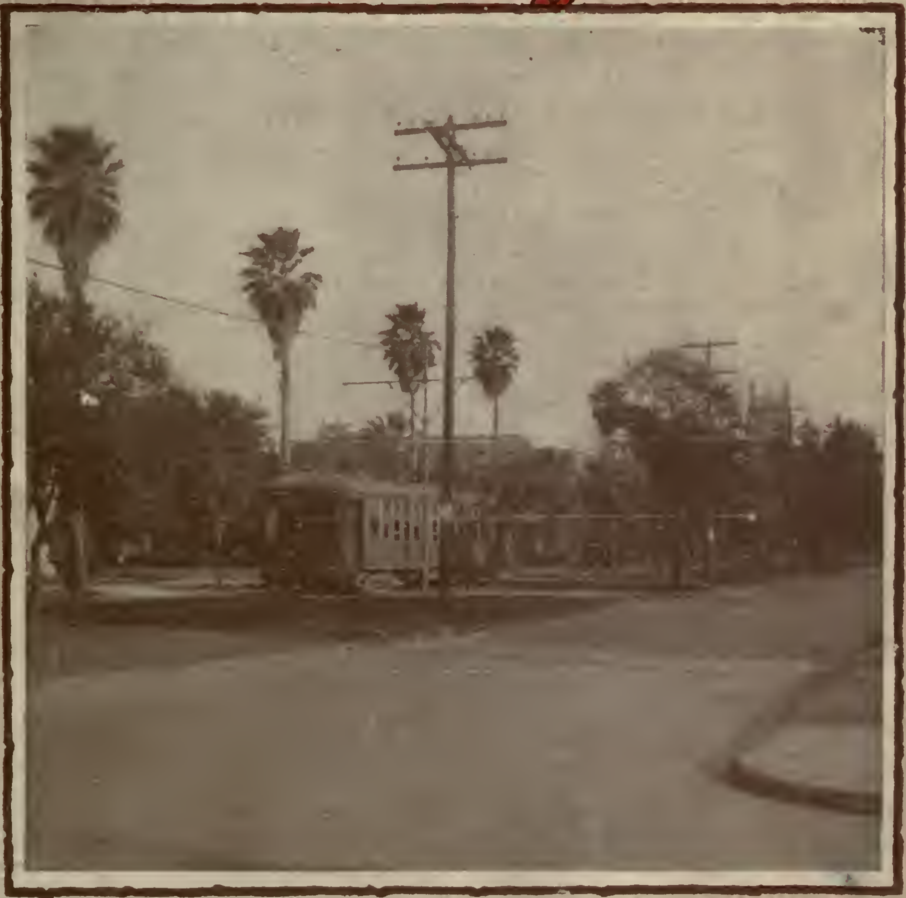
The American City



ST. CHARLES AVENUE, NEW ORLEANS, LA.

The right-hand side of street as shown is paved with 2½-inch asphalt on a 6-inch concrete foundation laid in 1884. The left-hand pavement is bitulithic laid in 1910. The neutral strip for street cars facilitates the maintenance of both track and street.

Your 1921 City Budget

can be Reduced MANY THOUSAND DOLLARS by adopting the

LEE SYSTEM

# of Refuse Collection and Disposal

Including Garbage, Ash and Snow, Etc.

Upon request we will have our engineer make a survey of your problem and submit without cost an estimate of your requirements and a detailed budget of the cost of installation and operation of the LEE SYSTEM.

Let us prove to you that our System is:

Economical—Efficient—Sanitary—Flexible—and easily operated, maintained and supervised.

Adopted by 17 cities in the United States.

The following data has been proved by actual operation under the same conditions:

System	Daily. Yardage.	Haul in Miles.	Daily Cost.	Cost per Yard.	Yearly Cost.
Wagon.	160	3	$142.97	$.89	$44,749.61
Lee.	160	3	109.95	.69	34,414.35
Lee Saving.			$33.02	$.20	$10,335.26
Wagon.	120	3	$120.25	$1.00	$37,638.25
Lee.	120	3	93.55	.78	29,281.15
Lee Saving.			$26.70	$ .22	$8,357.10
Wagon.	240	2	$151.43	$ .63	$47,397.59
Lee.	240	2	109.95	.45	34,414.35
Lee Saving.			$41.48	$ .18	$12,983.14
Wagon.	180	3	$114.50	$ .64	$35,838.50
Lee.	180	2	93.55	.52	29,281.15
Lee Saving.			$20.95	$ .12	$6.557 35

LEE TRAILER & BODY CO.

2343 So. La Salle St. **CHICAGO, ILL.**

Vol. XXIII THE AMERICAN CITY, November, 1920 No. 5

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879

VOLUME XXIII
NUMBER 5
The American City
NEW YORK
NOVEMBER,
1920

State and Municipal Aid for Housing

DURING the early months of 1921 most of the state legislatures will be in session. Many subjects will demand their attention, but none probably of greater interest and importance than the housing problem. The constructive proposals thus far advanced fall mainly into three groups:

(1) *The use of state or municipal credit to stimulate housing*

This proposal, although operating on a large scale in England and Canada, has not as yet appealed strongly to American ideas. The Canadian Commission of Conservation reports nearly 5,000 houses as under plan for construction this year with federal aid from the Dominion Government. North Dakota is experimenting with state aid to home building through a Home Building Association which is empowered to purchase land and erect homes for citizens who can advance 20 per cent of the cost of the house and lot.

(2) *Tax exemption on new dwellings for a limited period*

The New York Legislature, at a recent special session, adopted an act providing that the local legislative body of a county, city, town, village or school district may determine that new buildings, except hotels, shall be exempt from local taxation until January 1, 1932. The buildings must be planned for dwelling purposes only, and are exempt only while so used or intended to be so used. Buildings of four or more stories in height may have stores on the ground floor and still have the exemption. Construction must have been completed since April 1, 1920, or if not so completed must be commenced before April 1, 1922, and completed within two years after commencement. A state-wide act providing for a five-year tax exemption on new dwellings is in effect in New Jersey.

(3) *The creation of housing boards*

First among the suggestions of the State Reconstruction Commission of New York was the creation of housing boards. The plan was set forth as follows:

> "1. * * * That a law be enacted requiring the appointment of local housing boards in communities having a population over 10,000, the members of such boards preferably to serve without pay, and for the appointment of a central state housing agency for coördinating local effort. The function of the central and local boards shall be:
>
> a. Aiding each locality in meeting the immediate pressing need for sufficient homes.
>
> b. Collection and distribution of information relating to housing and community planning.
>
> c. Assisting in the preparation of housing laws, zoning ordinances, state-wide regulatory or restrictive housing and building codes, etc.
>
> d. Study of the means of lowering the cost of housing through better planning in the construction of homes and through their proper location.
>
> e. Development of a means for using state credits to apply to housing at low rates of interest without loss to the state. To set the standards for the use of such credits and to fix limitations upon the return of money borrowed from the state for housing purposes. To assist in the most practical manner possible in the erection of adequate homes in wholesome environments for workers at a rental cost dependent on the actual cost of land and building. This work to be preparatory to the passage of a constitutional amendment * * *."

As an aid to sound law-making, legislatures will welcome suggestions that have had the careful consideration of local bodies. Here is a big opportunity for municipal officials, chambers of commerce and other civic groups to stimulate legislation that will help American cities to solve one of their most pressing industrial and social problems—the housing of their people.

Actual School Conditions in 359 American Cities

Results of Nation-wide Inquiry on Teachers' Salaries and Training

By George D. Strayer

Chairman, National Committee for Chamber of Commerce Coöperation with the Public Schools

THE first inquiry sent out by the National Committee for Chamber of Commerce Coöperation with the Public Schools has elicited a highly gratifying response. Reports have been received from 359 cities of 8,000 population and above, in all parts of the country, rendering the survey representative of general conditions. The detailed questionnaires have been answered with intelligent sympathy, which makes it possible to prepare a general interpretive report of great national value. Judging from the results of the first inquiry, it seems safe to assume that the data collected by the several questionnaires will constitute the most important group of facts yet assembled on the subject of school conditions.

By enlisting the active interest of so large a group of chambers of commerce, an important impetus has been given to the general movement to improve school conditions. It is obvious that the chamber of commerce is in a position in the community to give direction to any movement. It is not sufficient merely to inform the public of the existence of conditions; past experience has shown that active measures must be taken if public sentiment is to be organized and directed.

Getting at the Facts

The plan to make the inquiry along broad lines was suggested at a conference of a group of superintendents of schools with secretaries of a few chambers of commerce, held in Cleveland, Ohio, on February 24 last, at the invitation of the American City Bureau. Before the meeting adjourned there was organized the National Committee for Chamber of Commerce Coöperation with Public Schools, to include 33 secretaries of chambers of commerce and 33 superintendents of schools, representing in all 62 different cities widely distributed throughout the country. Such a survey makes it possible for each city to learn its exact local situation and to be able to compare local conditions with those in other cities. The survey is very comprehensive in its nature. In all, three inquiries will be sent out. Gratifying reports have been received from the first of these. The second inquiry has already been sent out, and the third will follow in due course. The subjects covered are as follows:

Inquiry Number One:
- How much training do your teachers have?
- How well do you pay your teachers and others?
- What special inducements do you offer as regards tenure and pensions?

Inquiry Number Two:
- How well do you house your school children?

Inquiry Number Three:
- Part I.—What is your educational program? How adequately do you safeguard the children's health?
- Part II.—How much does education cost your city? How will the rising costs be met?

The Quality of Our Schools Must Be Maintained and Developed

The data already collected reveal a surprising situation. Despite the rise in salaries and the cost of living, the teachers in American cities are less well paid than in 1914. To be exact, the average increase in teachers' salaries during this period has been 61 per cent in the entire country; the increase in the cost of living has been over 100 per cent. The profession of teaching, being less well paid than even many unskilled forms of labor, will cease to attract many people. It is vital that the quality of intelligence, character and training of our men and women teachers should be of the highest possible grade. If teachers' salaries are lowered, there is a danger that a less desirable class of men and women will find their way into the teaching profession and that the schools of the country will thereby suffer.

The situation is growing daily more menacing. Concerted action is demanded if the quality of our schools is to be maintained. How much greater must the effort be if we are to improve and develop them! Many serious problems confront us. The necessity of Americanizing the foreign-born is imperative. Many factors combine to render the question before the public one of the most vital confronting us.

Salary Increases During 1913-20

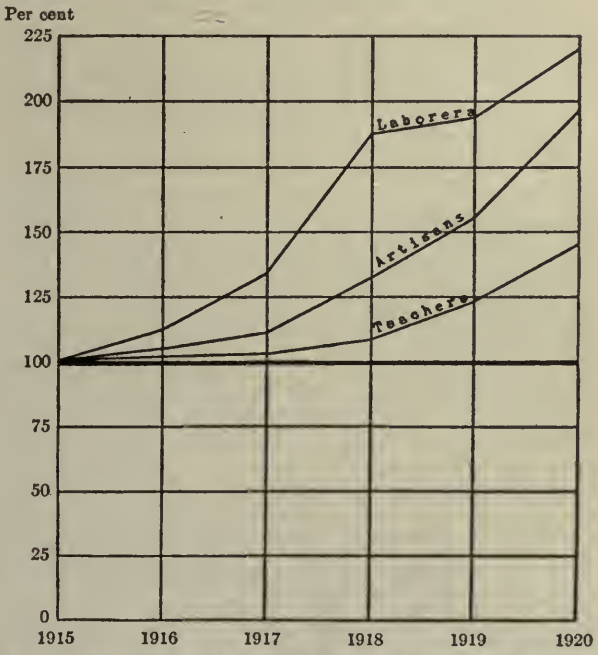
The inquiry throws an interesting light upon the question of salaries paid to elementary school teachers, both to men and to women. It is found that during the five years from 1913-14 to 1918-19 the salaries of teachers of this class advanced 19 per cent, while during the period from 1913-14 to 1918-20 salaries advanced 59.2 per cent. The year 1919-20 witnessed an advance of 40 per cent on the pre-war salaries and an advance of 34 per cent over the salaries of the previous year. In this connection it is interesting to note that 9 per cent in these cities in the pre-war days received salaries of less than $500 per year and that this percentage had fallen to less than one-half of one per cent in 1919-20.

There is, however, a tendency to pay more adequate salaries. It is shown in the increase in the number of elementary school teachers receiving more than $1,000. In 1913-14, for example, 12 per cent of the elementary school teachers received more than $1,000 per year, and in 1919-20 this proportion increased to 71 per cent. If we compare the salaries of all elementary school teachers, junior high school and senior high school teachers, it will be found that the salaries for all teachers have increased 61 per cent during the period 1913-14 to 1919-20. The figures show that there is a surprisingly wide range of salaries the country over. Many teachers still receive but a pittance for their work, and the proportion of those who receive a mere living wage is very small. The tendency throughout the country is to increase the lower salaries rather than the higher ones.

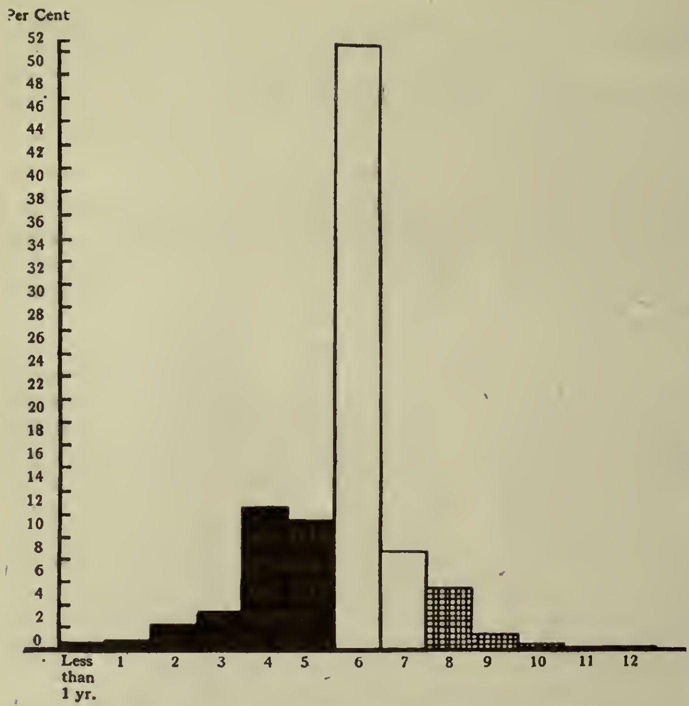
The Pay of School Executives

An interesting comparison is afforded in the salaries of superintendents, assistant superintendents, supervisors and assistants. Although these executives direct complicated organizations, their salaries are for the most part wholly inadequate. The tables disclose the fact that higher salaries are paid in the larger cities, but that the general average is lower. As a result, there is a serious shortage of such executives because of the competition of the business world.

A substantial increase must be made in this class of salaries if the schools are to be improved. The services of competent men and women cannot be obtained for such purposes for the salary commonly offered. The heads of these institutions should be adequately trained, and appointed only after years of experience. Although the general public was aware, before this inquiry was commenced, of the general situation, the



WHY TEACHERS LEAVE SCHOOL—INADEQUATE FINANCIAL RETURN MAKES THE PROFESSION DISCOURAGING



TRAINING OF ELEMENTARY SCHOOL TEACHERS

Solid black represents years of training beyond grammar school; white, 2 or 3 years beyond high school; checkered, 4 years or more of college

disclosures made by the inquiry comes as a distinct shock.

What the Principals Receive

The American high school has had a remarkable development in the past twenty years. Its organization has become more complex; it offers a wide variety of courses suited to the demands of the modern growing communities. It is obvious that much is expected of the high school principal. The responsibility of this position is very great. The present investigation reveals the fact that American cities paid high school principals on the average of $2,500. The head of any industrial organization of comparable importance would of course receive much more. There is a serious danger that the best material will be attracted to the interests paying higher salaries and that the American high school will suffer.

The same situation is revealed in the development of the junior high schools. In the past five years these schools have become an increasingly important factor in our school system. Occupying, as they do, an important position between the elementary schools and the high schools, their influence upon the American youth is very great. It is distressing to find from the present inquiry that the salaries often paid the heads of these institutions would be insufficient to hire a competent secretary.

In the elementary schools the situation is equally serious. The principal of such a school fills a very important post. He is in touch with the home, the pupils, and the classroom teacher. In half of the American cities last year the average salary was $1,800 or less. All this evidence shows that the American public fails to realize the importance of the work which these educators are called upon to do. A detailed study of the reports will be of inestimable value not alone to educators of the country, but to all public-spirited citizens.

Training Often Inadequate

The first inquiry furthermore reveals a very serious situation as regards the amount of training public school teachers have received. The average amount of training of the elementary school teacher in 359 cities is about 6⅓ years beyond the elementary school course. This means that one-half have less than this training and many very much less preparation. The average training of a junior high school teacher, as shown, is under 7 years beyond the elementary school course, while the average amount of training of the senior high school teachers is about 8½ years beyond the elementary school course. In other words, 50 per cent of the teachers in the American schools have had the average of less than 6⅓ years. It further shows that 50 per cent of junior high school teachers have had less than 7 years' training beyond elementary school, and that 50 per cent of the junior high school teachers have had less than 8½ years of training.

It is astonishing to find that so many teachers in high schools are not themselves graduates of high schools. Many city boards of education require teachers in the elementary schools to be at least graduates of state normal schools. This means that they have had the advantage of a two-year professional course after having graduated from a four-year high school. In this connection it should be noted that practically one-third of the teachers in American cities have actually had less training than even this low standard. In the elementary schools of America to-day there are thousands of teachers who have had no more education than that provided by very inefficient elementary school training. The tabulated returns from the first questionnaire will reveal many similar conditions.

Government figures place the present shortage of properly trained elementary and high school teachers at 90,000. These vacancies will be filled, but it is obvious that they will be filled with teachers lacking proper training. The appointment of so vast a force of "emergency" teachers must have a serious retarding influence upon our schools. Years will be required in the natural course of events to provide a sufficient number of adequately trained teachers to replace the emergency teacher. It is clear, therefore, that if our schools are to retain their present standing, an energetic effort must be made throughout the country to raise salaries and organize our general system of education. A study of the reports further reveals the fact that in over 100 cities it is a matter of pure chance that a teacher's training is properly rewarded.

Read the Report

The report, however, is not without its encouraging features. In many cases cities realize the seriousness of the situation and are attacking the problem with energy and intelligence. It is to be hoped that every public-spirited citizen, and especially all those engaged, however indirectly, in the educational system or the municipal governments of cities throughout the country, will take advantage of this report and acquaint themselves in detail with the serious problem which confronts us.

Editorial Note.—Applications for copies of the report "Know and Help Your Schools," referred to in the above article, should be made to Fred A. Richardson, Secretary, National Committee for Chamber of Commerce Coöperation with the Public Schools, Room 1720, Tribune Building, New York, N. Y.

HIGH SCHOOL AND STADIUM, TACOMA, WASH.

Safety to Public School Children in Well-Planned Fire-proof Buildings

By Norman M. Stineman

HALF of the new school buildings erected in the United States each year are built to replace structures which have been destroyed by fire.* Even if the burned buildings are fully covered by insurance—a rare occurrence—their destruction represents a direct loss of national wealth and adds another chapter to the story of our appalling fire waste. Each year we pay millions of dollars in tribute, and sacrifice the lives of school children to the ignorance and indifference of school officials who have built and still continue to build these monuments of faulty and dangerous construction.

Our Great Loss in Burned School Buildings

In 1919 there were approximately 300,000 school buildings in this country, valued at more than $3,000,000,000. The jeopardy in which this wealth is placed and the menace to the lives of school children may be appreciated from the fact that during 1916 and 1917 we had 4,915 fires in school buildings actually insured and on which adjustments were made.* This does not take into account the large number of fires in uninsured buildings, on which exact records are not available. It is a safe estimate that during the two-year period named, the number of school fires averaged no less than ten per day. Modern educational methods have a tendency to increase the number of fires, due to the introduction of laboratories, manual training rooms, domestic science kitchens and moving-picture machines, and a similar increase results from the growing use of school buildings as social centers. Our present record, thoroughly bad as it is, will therefore become worse unless corrective measures are taken.

How can we prevent this growing waste of wealth and this constant menace to human lives? Only one answer seems logical, and that is that we erect *school buildings which cannot burn.* This logic is well supported by the fact that materials of construction which are proof against fire and maintain their strength when subjected to great heat are also proof against rust and decay. Consequently the community that builds fire-proof schools obtains the additional qualities of permanence and of freedom from heavy repair and maintenance expenditures. It will find its operating expenses less than those of the neighboring community which built "semi-fire-proof" at a slightly lower first cost, having forgotten

FIRE-PROOF SCHOOL BUILDING, WATSONVILLE, CALIF.

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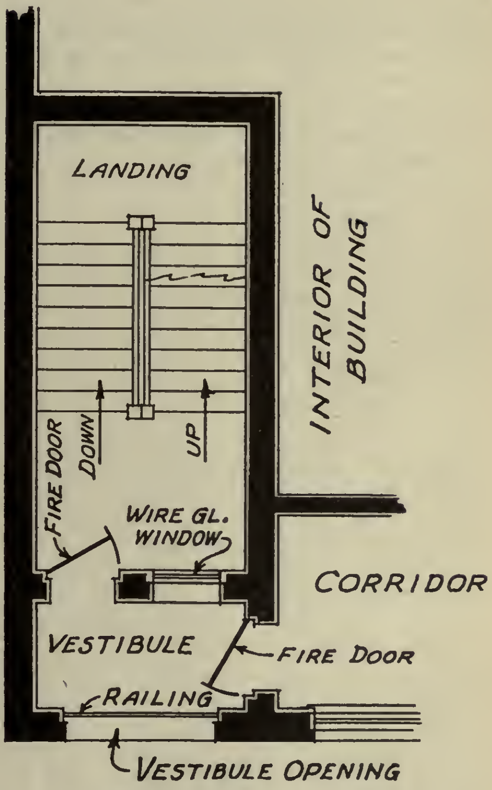
*See bulletin prepared for the Department of the Interior, Bureau of Education, Washington, D. C., by H. W. Forster, Chairman of the Committee on Safety to Life, National Fire Protection Association.

that first cost is only one of many factors entering into the ultimate cost of school buildings.

Even in cities with highly organized fire protection an occasional calamity proves the folly of erecting non-fire-proof school buildings. In small towns where only partial protection is afforded, and in country districts having no protection whatever, the need for absolutely fire-proof construction is still more apparent, for in these localities a fire in a combustible school building, once under way, nearly always results in complete destruction. A building that cannot burn, even when its inflammable contents become ignited, is the best and least expensive fire protection for an unprotected community, and is the only kind that can be justified from the standpoints of business investment and safety to school children.

What is a "Fire-proof" Building

If a building is to be really fire-proof, the partitions, floors, roof and stairs, as well as the exterior walls, must be of fire-proof material, so that a fire starting in the contents of any room will be confined to that room. Self-closing doors and wire-glass windows in the principal partitions, especially in corridor walls, will assist in preventing the horizontal spread of fires. In addition to the use of fire-proof materials of construction, proper planning is of the utmost importance in reducing the fire hazard and in promoting the health and comfort of pupils. Two stories and basement should be the limit of height, and this limit should be exceeded only in congested districts of large cities where ground space is specially valuable. The state of Ohio, though containing a number of large cities, prohibits the construction of school buildings more than three stories high. In country districts and small towns where land is cheap, and in cities where park land is available, the one-story building, without basement, is ideal. Every classroom may have an exit of its own. There are no stairs to be climbed and no fire-escapes to give a false sense of security. Laboratories may be lighted from skylights. Boiler rooms, chemical laboratories and domestic science kitchens, those prolific sources of fires, may be completely shut off from the rest of the structure. The additional cost of the more extensive roof on a spreading one-story building, as compared with a more compact multiple-story structure, is compensated for by lighter masonry walls and the elimination of stairways, ramps and emergency exits.



A SMOKE-PROOF FIRE TOWER

This fire-proof stair tower should be in regular use by the school children in going to and from the playgrounds. The opening in the exterior wall prevents accumulation of smoke in the vestibule

Safe Exits Essential

Two-story buildings present the usual problem of providing safe evacuation of the building in case of fire. But architects should get away completely from the so-called fire-escape, which is usually placed in a remote part of the building, often out of repair, with the approach sometimes littered with barrels and boxes. In the end it often proves to be a death-trap instead of a fire-escape. The fundamental weakness of fire-escapes of this type is that their success in time of emergency depends upon human perfection. If these escapes were regularly inspected, if they were always kept in repair and free from obstructions, if the janitor always kept the doors unlocked and the passageways clear, and if daily fire-drills were held, all might be well. But in almost every school fire in which lives of children have been lost, solemn investigating commissions have found that one or more of these things had been neglected. No one who understands human nature expects anything different.

In the temporary panic following a fire alarm the first impulse of the pupil is to leave the building through the exit regularly used. This impulse is instinctive and is not confined to human beings alone. The architect should take full advantage of this animal instinct by fireproofing the regular exits so that they will serve as emergency exits as well. School children can then leave the building through familiar channels, without being endangered by locked exits, obstructions, broken fire-escapes and other products of carelessness.

The Watsonville, Calif., high school is a notable case of a two-story building in which a high degree of safety and comfort has been attained. The building has reinforced concrete exterior walls, covered with stucco and trimmed with cast concrete stone. The auditorium walls, the walls and floors of the corridors, ramps and stair halls, the stairways themselves and the principal cross-walls, are all of reinforced concrete. The chemical laboratory and the boiler room are isolated by reinforced concrete walls, floors and ceilings. The only wood construction used is in the floors of the ordinary classrooms; and the instant the pupils on the second floor pass through the classroom doors they are in a fire-proof corridor leading to either of two fire-proof ramps and out through the corresponding rear entrance. These ramps and rear entrances are in daily use as the pupils pass to and from the playgrounds. The ramps are the regular means of communication between the first and second floors. Pupils on the first floor may pass out through one of the two front entrances or down short ramps and through fire-doors to the rear entrances. The slope of the ramps is two inches to the foot, and they are covered with cork carpet. Their use in place of stairs eliminates the danger of stumbling, and it is said that girl pupils and women teachers find them less fatiguing than stairs.

Smoke-proof Stair Towers

In buildings exceeding two stories in height the difficulties of rapid and safe evacuation are multiplied as the height increases. The general floor layout might be similar to that of the two-story building just described, with the fire-proof corridors leading to smoke-proof stair towers similar to those recommended by the National Board of Fire Underwriters, and illustrated in the sketch on page 469. The stairway is reached through an open air vestibule with the exterior opening extending from floor to ceiling and well protected by railings. These smoke-proof towers should be the regular channels of communication between floors and should lead directly to the playground entrances, so as to be in constant use. The fire-doors should be self-closing and should have wire-glass panels, and the vestibules should of necessity be larger than shown in the sketch. Elevators or any other means of communication between floors should be isolated in the same manner as the smoke-proof towers.

It is true that the first cost of wholly fire-proof construction is slightly higher on the average than so-called "semi-fire-proof" construction, which is in reality not fire-proof at all. But the *ultimate* cost of any structure, including first cost, repair and maintenance charges, insurance, depreciation and interest charges, invariably proves to be less for fire-proof construction than for any other type. School boards, however, are in office temporarily, and too frequently show a preference toward the type of construction which is cheapest in first cost. They ignore sound business principles and safety to human lives in order to make a satisfactory showing during their own terms of office. This vicious tendency on the part of school boards has been overcome only in communities where the taxpayers and the press have given proper support to the more progressive members of the boards.

More Public Convenience Stations Needed

By George W. Simons, Jr.
Chief Sanitary Engineer, Florida State Board of Health

IN this era of civic awakening when a realistic civic consciousness is strongly asserting itself along lines of municipal endeavors, it is very encouraging and worthy of note to observe the increased attention and popular demand directed to the greater need of public convenience stations. (It is advisable to designate it "convenience station" in lieu of "comfort station" inasmuch as the former is meeting more nearly the requirements and demands of the people, which will be later pointed out.) This potent and active civic consciousness is being instilled into many of our municipal authorities, through local social agencies, to a degree where the authorities have come to a bare realization that the citizen and taxpayer must be provided with properly located convenience stations, the construction and maintenance of which shall be defrayed from public funds. More and more are municipal housecleaning and housekeeping problems being studied and solved with special thought and consideration directed to those things which have most effectively to do with the health and happiness of the community. To-day, more than ever before, the public convenience station is being recognized by the citizen and also by the municipal authority as one of the greatest municipal necessities.

Only a few years ago (1915) no less an authority on public health matters than Professor W. T. Sedgwick in his annual presidential address before the American Public Health Association declared that "probably the most flagrant failure in American sanitation to-day is the almost universal lack of public convenience or comfort stations in American cities and towns. Failure to provide public toilet facilities in our towns and cities is to fail in one of the very elements of sound public health service."

The Convenience Station a Public Health Measure

Public convenience stations are public health necessities of maximum importance. Physicians have quite generally agreed that accessibility to convenience stations will often prevent much discomfort and physical suffering which might give rise either directly or indirectly to disease. One Chicago physician has expressed an opinion that "many of the common complaints that physicians meet with to-day are due very largely to the irregularity of bowel and

COMFORT STATION AND BOAT HOUSE, CARONDELET PARK, ST. LOUIS, MO.

bladder activity." Therefore the expenditure of public funds for a true convenience and benefit which will tend to minimize physical disorders and promote public health and morality is fully justified. The necessity for more municipal convenience stations as public health measures has only recently received state legislative endorsement and approval. During 1919 the Wisconsin State Legislature deemed the entire matter of sufficient significance to enact a statute requiring every incorporated city and village to provide and maintain a sufficient number of suitable and adequate comfort stations for both sexes. This is indeed a commendable and progressive step in public health legislation.

Conveniently located and adequate convenience stations are substantial and productive assets to any community. They represent a form of municipal improvement or betterment upon which the municipality can realize enormous returns, not only of a financial nature, but in many other ways. The city not provided with these properly located and suitable stations is marked, and her lack of a potential civic consciousness to secure them will herald her to the four winds.

Facilities That Should Be Offered

In the foregoing paragraph reference was made to the "convenience" in lieu of the "comfort" station. A comfort station should be more than a mere relief station—in every sense it should be a convenience. The primary function of a comfort station is to provide toilet facilities, yet it is capable of being made a true public convenience in many other ways, as illustrated by many stations now operating in cities throughout the country. In addition to toilet facilities these true convenience stations provide for parcel checking, paper and magazine stands, shoe-shining equipment, telephone booths, city directories, dressing compartments, vending machines for small necessities, rest rooms for women, etc. Such provisions as just enumerated serve to make the stations more nearly approach the "convenience" type and at the same time go a great way in financially maintaining the station.

In the past, and even now to a great extent, the urgent demand for public convenience stations has been provided by facilities offered in department stores, office buildings, hotels, depots and clubs. Previous to prohibition the saloon offered a popular relief station for men, which was extensively used; in fact, some former saloon keepers have made the assertion that their toilet facilities brought more business than the free lunch. With the passing of the saloon this burden has been thrown to the care of other institutions mentioned. In all probability every reader recalls facilities offered by establishments in his city. The writer knows of several large department stores that provide exceptional conveniences for both sexes—a good advertising means of getting people into the store. In Jacksonville, Fla., there is one centrally located hotel wherein the demand is so great for public toilet facilities that pay locks have been installed on every closet but one. The hotel stands to-day as one of the most beneficent institutions for the care of this public burden. The facilities in the average office building are under lock and key, and, furthermore, transients are not always welcome to the use of office-building toilets.

For the public to impose upon private enterprises and expect these enterprises to provide them with conveniences is unfair and unprofitable. It is clearly the duty of the municipality to care for the public in this matter. The concerns which provide elaborate facilities for the public's use usually have a motive in so doing. The modern city hotel with its well-attended, clean toilet compartments is very little benefited by a public constantly availing itself of the generously provided facilities. The wear and tear on fixtures, plumbing bills, excessive water bill, towel and soap service are ills to which the hotel is heir because a city is not sufficiently alert to its duty.

Reports from Twenty-Eight Cities

To ascertain the status of public convenience stations the writer has recently collected considerable information from cities throughout the United States. Twenty-eight cities furnished data showing to a degree to what extent the public convenience station has received attention. The indication is that convenience stations are universally receiving much more attention than ever before. Where formerly toilet provisions were made in some secluded spot, in some inaccessible basement, now suitable buildings of fitting architectural design lo-

COMFORT STATION, BENTON PARK, ST. LOUIS
The top of the comfort station is used as a band-stand

cated in open places easily accessible are the rule. The convenience feature of stations is receiving more attention also. Rest rooms for tired shoppers, dressing-rooms, telephone and checking-booths and other services are being added. In brief, the tendency is now to construct real convenience stations. In several cities, notably St. Louis, Mo., Holyoke and Lawrence, Mass., Los Angeles, Calif., Philadelphia, Pa., and Wilmington, Del., much constructive progress has been made. Birmingham, Ala., Norfolk, Va., and Milwaukee, Wis., were, at the time of the inquiry (1919), designing and preparing to install suitable stations in their respective cities on a comprehensive scale.

Cost and Maintenance

The cost of convenience stations is one of the first items to be considered by the city authorities, also in what manner the station shall be financed following its construction. The cost of a station varies with the type selected, the elaborateness of design, the size, the class of materials used in its construction, and other factors. The recent survey indicates that stations throughout the United States have varied in cost from $1,000 in one city to $25,000 in another city. The average cost of a well-arranged, well-constructed station appears to be about $8,000-$10,000. Several stations were installed in portions of centrally located existing public buildings, which cut down costs considerably. Dayton, Ohio, furnishes a good example of how a city building can be utilized to great advantage for convenience purposes.

Stations are maintained largely by council appropriation, taxation or budget. There does not seem to be any one general method by which the city can procure funds for these conveniences. Cost of maintenance varies as greatly as do the costs of initial construction. Some stations will operate for as low a figure as $100 per month, while others will consume $500 per month. This figure varies with the size and location of the station and with the attendance required. A station remaining open and supplying attendant's service at all times naturally requires a greater maintenance cost. Of the twenty-eight cities from which information was received, twenty-one, or 75 per cent, stated that employes were in attendance at stations at all open hours.

The matter of attendants is one of the greatest importance in the up-keep of stations—the careless public will tend to abuse when no one is on the job. The proper care and maintenance of a public convenience station will indicate to a great extent how popular the station will become. A station not properly maintained and supervised in a cleanly, sanitary manner will very soon become repulsive and a burden to the community, and the initial cost of the investment become a liability. Careful, constant supervision and hard work by attendants are necessary to a successful station. Attendants should be available at all times in both men's and women's compartments, and should have a rigid set of regulations to observe. Toilet paper, liquid or powdered soap and paper towels should be available free at all time. Thirteen of the twenty-eight stations reported that liquid soap was provided.

Every convenience station can be partially or wholly self-supporting, according to what extent it is a convenience. In those stations wherein only toilet provisions are made, pay compartments are available to those who desire a greater degree of service. Pay compartments made a little larger than free toilets, equipped with a lavatory, free towel and chair, make substantial returns to the city coffers, as already shown in several cities. In Dayton, Ohio, four pay toilets earn about $600 per year, and in Providence, R. I., one station earned about $2,600 per year. Provisions can also be made for the vending of pins, needles, combs, towels, shining of shoes, etc.

Location and Type

The selection of suitable sites for convenience stations is dependent to a great extent upon the city plan. They should be located so as to be of greatest service to the greatest number of people. These places are ordinarily congested business districts, at intersections of main arteries of travel, at prominent street railway transfer stations, public squares and parks. Stations can also be provided in connection with public buildings, such as fire stations, libraries, recreation pavilions, piers, etc. If stations are provided within public buildings, there should be direct entrances from the sidewalks to prevent unnecessary trespassing through buildings. In parks and public squares, specially designed, architecturally harmonious structures should be provided. In selecting suitable locations any possible objections from mercantile establishments should be given due consideration. Cases may also arise where property owners will raise the claim that a convenience station would cause a depreciation in the value of adjoining properties.

The patronage and use of convenience stations depends upon their location where people pass and assemble. Some cities have made mistakes by locating expensively constructed, excessively large stations in places remote from where the most people pass. It is better to build a trifle small than too large.

Convenience stations may be subdivided into underground stations and above-ground stations. The former have been used extensively in this country because of lack of space for a superstructure in congested localities, where the needs are greatest. In Brooklyn, New York City, Boston, Worcester, Providence, Washington and other places the underground type has been used widely, under sidewalks, under small open spaces at street intersections, and in small parks. In Washington complete stations have been constructed in a small space at the intersection of Pennsylvania Avenue and E Street Northwest.

Underground stations can at times be more conveniently located than above-ground stations, but the latter have more advantages and are more desirable. The underground station, unless exceptionally well located, depends upon pumps or ejectors for sewage removal, apparatus which demands much attention and frequently throws the entire station out of order. These stations are often poorly ventilated, insufficiently lighted and not properly waterproofed. A plentiful supply of good, fresh air, ample natural light, and dry conditions are conducive to greater cleanliness. Nowhere except in places where it is utterly impossible to secure suitable above ground stations should resort be made to those located under ground.

The principal advantage of the above-ground type from a sanitary standpoint is the fact that the building is sure to be well ventilated and will receive some sunlight and an abundant supply of fresh air. Plenty of light and air are foes to uncleanliness, slovenliness and dirt. The above-ground station should not, however, be too conspicuous, but should be an architectural gem, harmonizing with the surroundings. Climbing vines and flowers assist to make a building of this type attractive. In the above-ground stations better drainage facilities are obtained, better ventilation at less cost, and the annoyance from leakage of rain and ground water is eliminated.

Above-ground stations in public parks and squares should not be isolated and hidden away in dense clumps of bushes. One glance at such locations is sufficient to scare almost anyone from attempting to reach such a place. They are cold and repellant at all times, sometimes disgusting, and soon become filthy from neglect and abuse, then are abandoned.

There has been a tendency in some cities, notably St. Louis, to combine convenience stations with other park structures. In St. Louis several very attractive, architecturally pleasing band-stands have been built with convenience provisions underneath. A station of this type is now being planned for Jacksonville, Fla.

Every convenience station should be planned to consist of two distinct sections, one for men, the other for women. The plan should be as simple and open as possible; there should be ample room to prevent any congestion during hours of greatest use. In the men's section there should be a sufficient number of water-closets, urinals and lavatories, a slop sink and drinking fountain. Cities provide usually in the smaller stations for 8-10 closets. Urinals should be placed near the entrance, with ample width given to each urinal stall. The general rule of cities is to use the vertical slab urinal over which water is constantly flushing.

Following are tabulated the average number of fixtures and other data from various cities in the country:

Where statistics are available, indications are that station patronage is increasing. The following shows some figures taken from a St. Louis report:

COMPARATIVE ATTENDANCE AT COMFORT STATIONS

	Carr Square Comfort Station	Mullanphy Comfort Station	Public Comfort Station in P. B. No. 3
1910-1911....	397,895	....	....
1911-1912....	1,152,539	....	....
1912-1913....	1,046,606	....	....
1913-1914....	1,513,244	....	....
1914-1915....	1,456,422	142,861	....
1915-1916....	1,751,874	272,264	108,428
1916-1917....	420,407	276,038	72,603
1917-1918....	384,154	54,089	144,304
1918-1919....	....	22,161	94,017
	8,123,141	767,413	419,352

	Number of Stations		Av. Number of Toilets Per Station		Av. Number of Urinals Per Station	Av. Number of Lavatories Per Station	
	M	F	M	F	M	M	F
Akron, Ohio	2	2	4	4	4	4	4
Albany, N. Y.	*6	*6	6	6	6	2	2
Boston, Mass.	‡19	‡7	6	6	6	10	10
Dayton, Ohio	*1	*1	6	8	6	†5	†3
Des Moines, Iowa	*2	*2	3	7	1	†2	†2
Grand Rapids, Mich.	*1	*1	6	6	6	4	4
Hartford, Conn.	*1	*1	26	12	26	2	2
Holyoke, Mass.	1	2	8	11	12	6	6
Indianapolis, Ind.	*1	*1	†18	†9	—	4	2
Lawrence, Mass.	*1	*1	6	6	8	5	5
Los Angeles, Calif.	*3	*3	6	6	9	3	3
Montgomery, Ala.	*1	*1	1	1	1	1	1
Oklahoma City, Okla.	*3	*3	3	3	2–8	3	3
Oshkosh, Wis.	*4	*4	1	1	1	2	2
Philadelphia, Pa.	9	9	4	4	4	12	12
Providence, R. I.	2	2	7	7	7	4	4
Salt Lake City, Utah	3	3	10	8	10	4	4
San Francisco, Calif.	*4	*4	10	10	10	10	10
Spokane, Wash.	*2	*2	8	6	6	2	2
Springfield. Mass.	*1	*1	†10	†7	†6	7	7
St. Louis, Mo.	30	30	5	6	5	6	6
Wheeling, W. Va.	3	3	—	—	—	2	2
Wilmington, Del.	11	10	5	5	5	0	0
Yonkers, N. Y.	6	6	6	6	6	6	6
Portland, Ore.	2	1	7	9	6	5	5

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* Combined stations—men in one half and women in other half.
† Represents actual number of fixtures in each station.
‡ In Boston there are three stations for men alone, one for women alone, and six combined stations.

Annual Meeting of the National Municipal League

The twenty-sixth annual meeting of the National Municipal League will be held at the Claypool Hotel, Indianapolis, Ind., November 17, 18 and 19, 1920. The League goes to Indianapolis as the guest of the Chamber of Commerce of that city. R. E. Tracy, Director of the Bureau of Municipal Research of the Chamber, is acting for the committee on local arrangements. The subjects of the sessions include: "Service at Cost for Street Railways, Panacea or Nostrum"; "How the City Manager Plan Works—The Latest Evidence"; "Methods Whereby Civic Organizations Influence Elections"; "Government Aids to Housing"; and "The Fate of the Direct Primary." Hon. Charles E. Hughes, President of the League, will deliver his presidential address on the last-named subject. The Governmental Research Conference and the National Association of Civic Secretaries will meet at the same time and place. Joint sessions will be held with the Indiana Association of Commercial Secretaries and the Indiana Municipal League. For full program and details, address the National Municipal League, 261 Broadway, New York City.

Benefits Accruing to Municipalities Through the Federal Water Power Act

By O. C. Merrill

Executive Secretary, Federal Power Commission

THE Federal Water Power Act approved by the President on June 10, 1920, represents the results of more than ten years of endeavor to secure legislation permitting the utilization of the nation's undeveloped water-power resources. The recurrent coal shortages of the last few years, the overloading of our transportation systems, and the vital need of an increased power supply for general industrial purposes, finally induced conflicting interests to compose their differences, and the resulting Act, while by no means perfect, is better than even its friends had hoped to secure.

The Federal Government, through its control over interstate and foreign commerce, may give or refuse its assent to the erection of any obstruction in a navigable stream. Through its ownership of the public lands it may exercise a proprietor's right to permit or refuse to permit its lands to be used for any purpose. Through the one form or the other, as sovereign or as proprietor, the Federal Government controls probably not less than 85 per cent of the water-power resources of the nation. Since not more than 10 per cent of these resources have yet been developed, the manner in which the Government exercises its control will have an important bearing on the course of our future industrial development.

Federal control has hitherto been exercised by three separate Departments—War, Interior and Agricultural—responsible, respectively, for navigable rivers, public lands and National Forests. This triple jurisdiction has now been consolidated into a single agency—the Federal Power Commission, the members of which are the Secretaries of the three departments named. They will, however, upon matters affecting water powers, act as members of a commission and not as heads of independent departments. By this consolidation, duplication of work may be avoided, a common policy pursued, and all efforts directed toward a constructive national program of water-power utilization.

Far more serious than divided jurisdiction has been inadequate legislation. Prior to the passage of the Act, two Federal statutes governed the disposition of water powers. One, enacted in 1901, applied to public lands and reservations; the other, enacted in 1910, to navigable waters. Under the former, only a permit could be given, revocable at will. While several thousand horse-power have been developed under the provisions of the Act of 1901, such developments have consisted largely in extensions to existing systems, where the property not subject to permit was sufficient to serve as security for the financing of the property subject to permit. The Act of 1910 placed unknown liabilities upon those who sought to make developments under its provisions, and rights acquired were subject to repeal by act of Congress. Although numerous grants were made under the provisions of the Act of 1910, no projects of consequence were ever carried to completion. Both acts failed to give the security which would warrant any general development under their provisions.

Capitalization Limited to Actual Cost

The chief purpose of the new legislation has been to provide conditions under which capital can be secured in ample amounts and at reasonable interest rates, while at the same time fully to protect the paramount interests of the public in its last great national resource. This has been done by providing a definite tenure and definite provisions for disposition of properties. Applicants whose plans are approved by the Commission may secure licenses for periods up to fifty years, revocable only for failure to comply with their terms, and terminable before their expiration only by purchase of the properties in condemnation proceedings.

At the end of the license period the United States may either purchase the property itself, permit the purchase by another or issue a new license upon reasonable terms to the old licensee. The purchase price is the "net investment" in the properties, an amount determined by subtracting from the original cost the balances in depreciation and amortization reserves accumulated during the period of the license from earnings in excess of a fair return upon the properties. No appreciation in land values, no intangible elements, no expectation of future earnings, can be capitalized and added to the price to be paid. Settlement is on a straightforward business basis of return of each honest dollar of investment, no more, no less—a basis understood from the beginning, and currently determined by the accounting system. No chance is given for speculative profits; no dangers are involved beyond those incident to any business enterprise.

In order that the net investment may be currently determined, the Act provides for the maintenance of a system of accounting, and for the filing of detailed reports upon the costs of structures, equipment, lands or other properties. All existing properties operated under authority granted by earlier acts, if brought under the provisions of the present Act, are required to be valued, and the fair value thus determined becomes the net investment of the licensee at the date of determination. Capital changes on account of subsequent additions will be controlled by the accounting principles prescribed under the terms of the Act. Properties must be maintained in adequate repair and efficient operating condition, all necessary renewals and replacements must be made, and adequate depreciation reserves must be established and maintained for this purpose. These requirements will not only protect the United States as a possible future purchaser of the properties, but will also protect the properties in the interest of the licensee and of the public whom he serves.

Regulation by the States

The Act recognizes the advisability of local regulation of rates, service and securities by conferring jurisdiction on the Commission only when the states have no authorized agencies for the purpose. Even when the power developed enters interstate commerce, the Commission is not expected to act unless the states directly concerned are without authority or cannot reach an agreement. The Act provides that in valuation for purposes of rate-making, no value shall be claimed by the licensee in excess of the net investment in the property. In this respect, as with recapture, the Act has been drafted on the principle of full recognition of every dollar honestly invested, but no more.

From the standpoint both of the public and of the investor the basing of property values upon cost is one of the most important features of the Act. To the investor it means security for the capital used; to the public, charges based only upon the amount actually required to place the properties in operation. To both interests it offers a basis which will enable public regulating agencies to deal with the rate of return as such, uncomplicated by doubts concerning the validity of the rate base as determined through the ordinary valuation proceedings.

The permanent retention of power sites in public ownership and the fixing of property values at cost, both of which are largely determinative of the rate base, can be accomplished only by the Federal Government, the first through its control over the public lands and navigable rivers, the second through its contractual relations with its licensees. Except in instances where the Federal Commission will be required to act, the determination of the other factor in service charges—the rate of return—will be the duty of the state. Upon the spirit with which this duty is exercised, no less than upon the spirit with which the Federal Act is administered, will depend the extent of our future water-power development and the economic stability of the electric-power industry.

Preference Given to States and Municipalities

These are the general features of the Act. Special provisions are made for developments by public agencies. If, in the judgment of the Commission, any specific project, or the power available at any Government dam, should be developed by the United States itself, the Commission may not approve an application therefor, but is required to make reports and estimates of cost to Congress in order that the latter may determine whether the United States should undertake the construction. States or municipalities are given preferences in obtaining licenses and, with the exception of Government dams, are not required to pay rental charges for any power developed which is sold to the public without profit or is used for state or municipal purposes. States and municipalities are also preferred applicants for sites upon which licenses have expired, and may purchase the properties on the same terms as the United States itself.

While no one can safely predict the trend of public ownership during the next fifty years, it is probable that the agency through which the public will most often act will be either the municipality or the state. In so far as Federal legislation can do so, the Water Power Act provides the medium through which these agencies can secure the right to make use of the power sites under Government control, whether such sites are on the navigable streams where, ordinarily, the necessary lands must be acquired by purchase, or on the public domain where the license itself gives the right to occupy all the land needed for the project.

The supply of electricity for light and power is becoming more and more an indispensable service. The Act seeks to provide conditions under which this essential service can be performed in a satisfactory manner at reasonable rates. It provides an open road for public agencies wherever the public believes it can best serve its own needs. It requires private agencies to render service at the least cost which will attract sufficient capital to maintain the service. While it recognizes that the opportunity to earn a reasonable profit is the only consideration that will bring private capital into power development, it requires that the capitalization on which rates are based shall be limited to actual cost—a situation that has seldom existed in the past. This is the outstanding feature of the new legislation, more important from the public standpoint than any other provision, and one under which it may safely be left to the future to determine whether in the long run public or private development will give the better service at the lesser rate.

Falling Prices Will Increase Incendiarism

Fire Chiefs Must Increase the Thoroughness of Inspection to Overcome this Evil

DURING the last year or two incendiary fires have been few; business has been too good because of the high price levels. There are hundreds, probably thousands, of firms and individuals who cannot stand a sharp break in prices. Their profits are built on inflation. They include many factories which were equipped during the war or since, and thrived because commodities of every sort have brought unheard-of prices. They include also the speculating profiteers, who have hoarded the necessities of life on a rising market, greedily holding them for ever-higher prices, despite the scorn which has been heaped upon them. Many merchants are said to be overstocked also. If the break in prices should come suddenly, we shall have to be on guard. We all know that many warehouses are stocked to bursting with food and clothing, and information trickles out from time to time that speculators have overplayed their game; that they have overloaded; that many of them will be victims of their own greed and will find themselves obliged to disgorge at a loss. But will they? Fire insurance for a year past has been written on inflated values, and the insurance companies are frankly disturbed.

We may have some pity for a man—although we cannot condone the act—who, having invested his all in an honest business venture and failed, is driven to desperation and the torch, but we can have no consideration for the conscienceless scoundrel who withholds necessities from his fellow citizens and burns them when the market blasts his unholy venture. Justice demands that all such find repose in penitentiaries for the maximum sentences. Let us therefore prepare now to meet this emergency. Some lines are showing a tendency to drop. Every suspicious fire should be scrutinized more carefully than ever before. Every fire chief should work in closest coöperation with the fire marshal of the state, and the best efforts of both should be brought to bear to see that the prison doors await those deserving them.

Acknowledgment.—From a paper read by John G. Gamber, State Fire Marshal, Illinois, and President, State Fire Marshals Association of North America, at the convention of the International Association of Fire Engineers, Toronto, Canada.

Railroad Grade Crossing Elimination

By Samuel T. Wagner

Chief Engineer, Philadelphia and Reading Railway

GRADE CROSSING ELIMINATION IN DETROIT

View of Grand Trunk Crossing at Second Avenue, showing simple architectural treatment

LET us assume that a railroad is constructed through a community which is more or less sparsely settled. After its completion, the improvement of the surrounding country, with its villages and towns, calls for development along the line. Additional highways, as necessary arteries of traffic, are constructed to care for changed conditions, and in many cases are forced to cross the line of the railroad at the same level as the tracks, making what is technically known as a "grade crossing." We have thus the creation of a condition which is bad and which becomes worse as the traffic on either the railroad or the highway, or both, increases. Not only is it a dangerous condition, but, occurring when traffic is heavy on both railroad and highway, may become extremely objectionable on account of delays to traffic on the highway.

When railroads were constructed many years ago they crossed most of the existing highways at grade. Any other method in those days would have been impracticable on account of the cost of building under or over the tracks, and in many cases, if it had been necessary to eliminate the crossings at that time, the result would have been the abandonment of the construction of the railroad on account of the difficulty of obtaining the necessary funds. In many cases also where new highways were opened over the railroad at grade, the cost of construction in any other manner would have been prohibitive.

At the present time the situation is changed over practically the entire country; no new railroad or highway can cross another at grade. Existing laws provide against such construction in most places. Such laws are proper and advisable in every way.

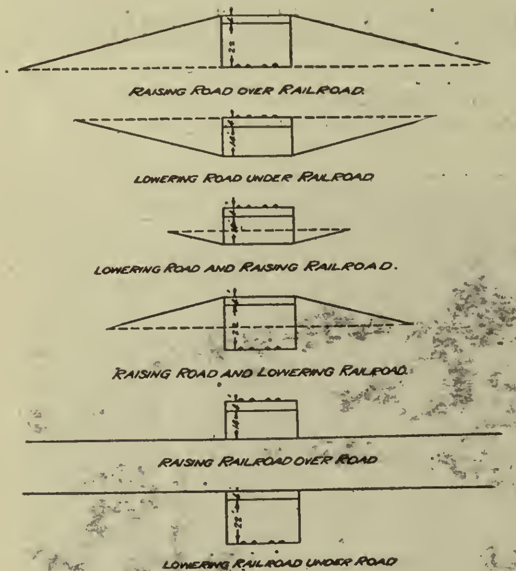
Our problem is, how are we to get rid of the old grade crossings that are in existence?

What the Problem Involves

The engineering problems required in such construction call for a high grade of engineering skill, and cover among others the following specialties of the art of engineering:

- Construction and location of railroads and highways
- Railroad and highway bridges
- Sewerage and drainage problems
- Construction of retaining walls, etc.
- In involved problems, the reconstruction of railroad yards, passenger and freight stations, locomotive and car facilities, which may be affected by the changed conditions
- Changes in the industrial connections with the railroad
- Electrical and mechanical engineering problems: lighting, duct work, power houses, etc.

In a general way there are six methods


RAISING ROAD OVER RAILROAD
LOWERING ROAD UNDER RAILROAD
LOWERING ROAD AND RAISING RAILROAD.
RAISING ROAD AND LOWERING RAILROAD
RAISING RAILROAD OVER ROAD
LOWERING RAILROAD UNDER ROAD

METHODS OF CROSSING

by which a grade crossing may be eliminated:

1. Raising the highway over the railroad
2. Lowering the highway under the railroad
3. Lowering the highway and raising the railroad
4. Raising the highway and lowering the railroad
5. Raising the railroad over the highway
6. Lowering the railroad under the highway

Which of these is to be used depends entirely upon the local conditions in each case. The relative importance of the railroad and the highway, together with the question of cost, are the usual deciding factors. The latter is of great importance, as neither the railroad nor the community derives any financial benefit from the expenditure. The problem is further complicated when a number of crossings are located so close together that they must all be treated at the same time. Nothing but the most careful engineering studies and estimates of cost will determine which is the best for any particular case.

Experience shows that the greatest costs will be indicated when the highways are to be carried over the railroad. In this case a clearance of at least 22 feet is required over the railroad tracks, plus a depth of about 4 feet for the bridge, making a total of about 26 feet for the change. If the railroad crosses the highway, a clearance of 14 feet over the highway plus a depth of about 4 feet for the floor of the bridge makes a total of about 18 feet. The difference of 8 feet between these two cases represents a large expenditure of money.

When the territory adjoining the railroad is built up with expensive properties, the damage to the properties caused by any change in the elevations of the highway may be great and must be considered as part of the cost of the scheme. Sometimes also the change in the level of the railroad may be very serious where it involves the reconstruction of railroad yards, stations and other facilities.

Again, the depression of either railroad or highway may involve troublesome and expensive problems by the creation of a hole which it may be difficult to drain. This is especially true in level country.

Frequently in built-up territory, as in a city, the depression of the tracks of the railroad may offer the most esthetic solution of the problem from the standpoint of the city, as it allows the elevations of the streets to remain unchanged. An elevated structure never presents a very pleasing effect.

As between a complete elevation of the railroad and a complete depression of the same, we have facing us the question of cost. In two large problems in the same city involving very similar conditions, the relative expenditures expressed in costs per mile of the railroad were as follows:

Depression of the railroad	$2,700,000
Elevation of the railroad	1,891,900

Legislation on Division of Costs

A whole volume might be written on the question of existing state legislation regarding the question of grade crossing elimination. It must serve our purpose for the present discussion to say that existing legislation provides about as many varieties of the division of the costs of grade-crossing elimination as there are varieties in engineering solution. In some states the laws require practically the entire cost to be borne by the railroad; none of them place the whole cost on the community. Between these two we have a great variety in practice as to how the cost of the work is to be divided between the railroad, the state, the county and the township. In quite a number of instances the practice is divided about equally between the railroad and the community, the percentages varying in the state, county and township. Most of these latter cases are where the blame—if it can be so called—for the original creation of the crossing is fairly divided between the railroad and the community.

Practically all modern legislation makes the creation of a new grade crossing illegal.

As an illustration of the effect of legislation on the division of cost, the following table is given showing some important work in the city of Philadelphia and the division of costs arrived at by agreement:

Year	Location	Railroad's Share	City's Share
1892	Penna. R. R. (connecting R. R. & N. P. R. R.)......	$ 100,000	$ 200,000
1894	P. & R. (Pennsylvania Ave. Subway)	2,750,000	2,750,000
1897	Penna. R. R. (Phila. & Trenton).......	1,250,000	750,000
1900	P. & R. (Chestnut Hill Branch)......	146,000	70,000
1906	P. & R. (Main Line & Richmond Branch).	5,000,000	5,000,000
1916	P. R. R. & B. & O. (South Phila.).....	14,760,000	9,000,000

The Cost of Eliminating Grade Crossings

As before stated, no financial return can be expected from the money invested in the elimination of a grade crossing, and there is no way in which any financial return can be figured to the community in which they occur. In fact, experience has shown that properties which are adjacent to the improvement have not been benefited by the new work to the extent that their values have been increased, thus deriving additional revenue to the community in the form of increased taxes, but rather that every individual claims all he can in the way of damages which may grow out of the construction.

The cost of the elimination of even a single grade crossing is a serious matter. A statement published in 1916 by the Pennsylvania Railroad Company is interesting in this connection:

What the Pennsylvania Railroad System Has Done

"There remain on the 11,000 miles of the Pennsylvania Railroad system 13,027 crossings at grade. It costs an average of at least $50,000 to remove a grade crossing. Thus to eliminate every such crossing on the lines of this system would cost upward of $600,000,000. The various companies of this system have since 1902 expended $66,641,294 in improvements, resulting in the elimination of 1,052 grade crossings."

Attenton is called to the fact that these prices are pre-war prices, and that existing prices would probably be from 60 to 100 per cent greater.

A railroad cannot go out into the market and borrow money for a project which will not show a return on the investment; therefore, they are usually compelled to provide the money for such improvements from funds derived from operating returns. Much as the railroads would like to proceed diligently in the prosecution of such work, they are forced to go slowly on account of the difficulty of obtaining the necessary funds. Municipalities are able to borrow on bonds for such purposes, but it must be borne in mind that the cost thereof is spread over the entire territory covered by the taxable power which borrows the money.

For the above reasons it is advisable that all existing grade crossings should be classified in order of their importance, which is generally based on the combined traffic on both railroad and highway, although peculiarly dangerous local conditions may have much weight. For instance, we might divide them into three classes and number them "A," "B," "C." If this were done it would be good policy not to proceed with the elimination of any crossing in Class "B" until all in Class "A" had received attention. This would prevent any comparatively unimportant crossing's being taken up out of place.

While the subject of the *protection* is not included in this discussion, it is pertinent in this place to say that there are a number of methods of crossing protection which the *Railway Review* gives in the order of their effectiveness:

1. Gates operated by day and night
2. Crossing flagmen, day and night
3. Gates by day, automatic bell by night
4. Crossing flagmen by day, automatic bell by night
5. Crossing flagmen by day, unprotected by night
6. Automatic devices only, such as crossing alarm bell or automatic flagmen
7. Crossing unprotected save by signs

The observance by the public of the legal requirements to "Stop, Look and Listen" would prevent many accidents which happen. Careful statistics show that the vast majority of accidents are caused by persons who do not "Stop, Look and Listen" when approaching a grade crossing, and very large numbers of cases occur where vehicles are driven directly into and through gates and actually into the sides of moving trains. The only way to avoid such accidents is to make the crossing "fool-proof" by eliminating the crossing; but it takes a lot of money to do it.

Relatively unimportant crossings can by the above methods of protection be made safe until the time comes for their elimination.

Maintenance of Travel During Construction

It is quite evident that one of the serious problems arising in the practical application of work of this kind is the manner in which (a) the traffic on the railroad is maintained during construction, and (b) the traffic on the highway is kept open.

As in the general problem, this detail is one that depends entirely upon local conditions, and has to be solved for each special case. Whatever method is decided upon is sure to result in some inconvenience to both railroad and highway traffic during construction. It may mean handling traffic on half of a highway or on a single track of a double-track railroad. Sometimes it is possible to detour both kinds of traffic, but this is rare. Generally it is very difficult to change the grade of a highway and maintain traffic. It is only in rare cases that traffic is maintained on half of a highway. Restricted traffic on a railroad is usually easier to care for in a physical manner, but the delays to traffic are serious. In case the highway is a city street, the work involved is very complicated, as it involves the care and moving of all underground structures, as conduits, sewers, water and gas pipes and their house connections, so that the whole bed of the street is practically torn to pieces. While all this is being done it is very difficult to maintain travel.

Some method has, however, to be found in each case to take care of both kinds of traffic during construction, and the simplest and cheapest is always the best.

Esthetic Considerations

Particularly in cities and in suburban sections the question of a pleasing-looking structure is of importance. There is probably no type of engineering work which is harder to treat esthetically than the structures required in the elimination of grade crossings. This means that the engineer should do his best consistent with economy. If there happens to be sufficient headroom, no form of structure is more pleasing to the eye than an arch, and it should be used not only for its pleasing appearance, but also for its low cost of maintenance. Generally, however, some type of girder construction becomes necessary in order to utilize every inch of headroom. When this is the case it is advisable to place as many supports in the highway as possible, so as to reduce the length of the span and the consequently greater depth of the girders. This is also of prime importance from the safety standpoint of the railroad, as it prevents girders from projecting above the tops of the rails, forming dangerous obstructions to the trainmen. Columns on the curb lines and in the center of the driveways will generally accomplish this, and the objections held at one time to the division of a driveway by a line of columns are fast disappearing, as such construction serves to separate vehicle traffic and keep it on the proper side of the highway. The lower the depth of the girders over a highway, the more pleasing-looking is the structure.

Acknowledgment.—Reprinted by permission from the J. E. Aldred Lectures on Engineering Practice, Johns Hopkins University, Baltimore, Md., 1919-1920.

Appropriations for City Planning Commissions

Detroit (population 993,739) appropriated $50,000 for 1919 and $42,000 for 1920; St. Louis (population 772,897) appropriated $25,500 for 1917-18, $24,270 for 1918-19, and $19,160 for 1919-20; Cleveland (population 796,836) appropriated $24,000 for 1920; Cincinnati (population 401,247) appropriated $10,000 for 1920 (with similar amount promised for 1921 and 1922; this has been supplemented by subscriptions of citizens already amounting to $25,000 and expected to reach $70,000 this year, at the disposal of the City Plan Commission); Akron, Ohio (population 208,435), appropriated $19,000 for 1920; and St. Paul, Minn. (population 234,595), appropriated $25,000 for 1920. This list is gratifying evidence of municipal far-sightedness.

The Toronto-Hamilton Highway

A Vital Factor in Increasing Highway Traffic and Land Values

By Norman S. Rankin

THE Toronto-Hamilton Highway is probably of greater importance than any other section of highway in Canada. It joins Toronto with a population of about 600,000, and Hamilton with about 110,000, and is an important link in the highway which is being constructed from Windsor, Ontario, opposite Detroit, and from Niagara Falls, Ontario, to Montreal. It will continue to be important not only on account of the constantly increasing commercial traffic, but also on account of its attractive location. The roadway skirts the shores of Lake Ontario for half of its length and passes through a section of Ontario rich in historic association as well as scenic beauty.

It was begun in 1914 to relieve a very serious condition of unemployment in the urban centers, which followed the entering of Canada into the great war. The work was placed in the hands of a special Commission consisting of George H. Gooderham, chairman, G. Frank Beer, W. S. Davis, R. H. Lush, M. C. Smith, T. W. Jutten and H. Bertram. On account of the relief feature, the Commission decided to carry the work on by day labor. Original plans called for a cement concrete roadway 16 feet in width, but the minimum width was increased to 18 feet before laying of concrete was begun, and later increased to 24 feet on the 5 miles nearest Toronto. The minimum width of subgrade is 26 feet, and earth shoulders have been provided except in special instances where broken stone has been added. More than fifty bridges and culverts have been replaced by modern reinforced concrete structures designed to carry a 20-ton road roller and having a minimum clear width of roadway of 26 feet. Four of the larger reinforced concrete structures are of the so-called truss type. The largest clear span is 120 feet, probably the maximum span for bridges of this type on this continent.

Several comparatively short diversions were made, but in general the highway follows a previously existing road allowance. The route followed, however, was not

A STRETCH OF CONCRETE PAVING ON THE TORONTO-HAMILTON HIGHWAY
At this point the grade was reduced from 8 per cent to 1 per cent, necessitating the removal of about 20,000 cubic yards of earth

previously the one most travelled between Toronto and Hamilton. Part of it was sandy and for that reason used in bad weather, but much of it was little more than a trail, the travelled portion being 10 or 12 feet in width. Maximum grades of 11 per cent have been reduced to 4 per cent, and none of the remaining curves have a radius of less than 300 feet.

The Benefits Which the New Highway Has Brought

A traffic census taken just before construction was begun showed a total of 526 vehicles per day on the most heavily travelled portion, including three motor trucks. On the busiest days now the traffic exceeds 8,000 vehicles, the average being about 3,000 and the average motor truck traffic about 400 per day. The road is kept open throughout the year in spite of rather severe snow-storms. It was not closed for a single day during last winter.

Farmers living 15 miles from the Toronto market who formerly made three trips by team per week by being up early and late, now leave home at eight in the morning and are home for dinner and supper, and make 12 trips per week by motor trucks in comfort. Many of the farmers sell all of their market produce at their own gates to the motorists, and some of them living six miles off the highway haul it to the wayside and the community markets which have been encouraged by the Commission.

A conservative estimate, based on a partial investigation, shows an increase in land values of six million dollars since the highway was first projected. Excellent homes are being built all along the road, as districts 30 miles out are nearer in point of time than those 5 miles out were before the improvement.

The use of a comparatively high-priced surfacing, cement concrete, has been justified by very low maintenance figures. Regardless of the great increase in traffic and in the cost of material and labor, the cost per mile of maintenance on the concrete roadway was less in 1919 than in any previous year since construction was completed.

The greatest benefits have not been material, however; perhaps they are best expressed in the words of the wife of one of the farmers along the highway:

> "Words cannot tell what it is doing for us. We have lived here for twenty years, ever since we were married. Our children are growing up here. As you know, this road was not previously the most travelled. On account of the heavy sand it was avoided in dry weather, but was the only possible road when rain made the clay stretches on Dundas Street impassable. Travellers were few—we used to huddle by the window in the front parlor and carefully peek out under the shades to watch them go by. Their heads were down. If it was necessary to turn out to pass another rig, we had to close our ears to keep out the burning language. They cursed the country, the province, the county, the township, the farm. We were ashamed. But now, hundreds go by where one went before. Everyone is sitting up straight with a smile on his face. We sit on the front balcony and enjoy the cheery greetings. When they pass another rig there is a wave of the hand: often we hear, 'A fine day,' 'A dandy road,' 'Best crops we have ever seen.' We are proud of our farm, our county, our province, our country."

The Toronto-Hamilton Highway is making for a higher type of citizenship.

Membership in the Permanent International Association of Road Congresses

The International Commission of the Permanent International Association of Road Congresses, at its meeting held in Paris on June 21, 1920, unanimously voted to accept an invitation to hold the Fourth International Road Congress in the United States in 1922 provided an invitation from the United States Government is received by the Executive Committee of the Association before January 1, 1921. If an invitation is not received from the United States on or before December 31, 1920, the invitation from the Italian Government will be accepted. As a regulation of the Association stipulates that an International Congress cannot be held in a country whose government is not a Permanent Member of the Association, it will be necessary for the United States Congress, during November or December, 1920, to pass an appropriation which will provide for the annual subsidy of the United States as a Government Member of the Association and which will enable the Secretary of State to extend an official invitation to the Association to hold the Fourth International Road Congress in the United States in 1922.

The International Association should be supported by Americans who wish to see the science and art of highway improvement and highway transport rapidly develop throughout the world, who believe in an international medium for the exchange of opinions and conclusions, and who wish to be well informed relative to progress in highway engineering and transportation in foreign countries.

Motorizing American City Departments

The Use of Passenger Cars in City Administration

By John D. Long

IT is hardly necessary to call attention to the fact that the use of passenger automobiles is a means of speeding up the various departments in American city administrations. This result is obvious in such divisions as the Police, Health, Public Works, and Fire departments. Disturbances and incipient riots can be quelled more promptly through the greater speed of motor cars. A condition of disease contagion can be dealt with more promptly where the health department has the use of speedy passenger cars. In fact, almost every civic and administrative activity can be made more prompt and effective by the use of this modern aid to efficiency.

Recently the National Automobile Chamber of Commerce addressed a questionnaire to the mayors of all cities in the United States. This questionnaire was sent out as an aid to making a study of the use of the passenger car in civic life. The city executives were asked: "Can you tell us how many passenger cars are owned by your city government, and to what departments they are assigned?" To date replies have been received from about 300 municipalities.

Some cities have made no particular effort at exactitude in replying. One mayor, for example, writes: "I estimate that the total number of passenger cars in use by the city of Newark approximates 45." Similarly, the Deputy Director of Public Affairs in Jersey City, N. J., states: "The number of passenger cars in the city service must be in the neighborhood of 60 or 75."

In quite refreshing contrast is the accurate and detailed information submitted from many other cities. The cities of Massachusetts seem to excel in the use of the passenger automobile in city affairs. Some 30 cities from Massachusetts send in their reports, and most of the information is very full and specific. Boston naturally reports the largest use of passenger cars, the total reaching 119. It is interesting to notice how the cars are distributed among the various city activities: Building Department, 3; Cemetery Department, 2; Consumptives' Hospital Department, 1; Fire Department, 30; Health Department, 5; Penal Institutions Department, 1; Park and Recreation Department, 11; Police Department, 18; Public Works Department—Central Office, 1; Bridge Service, 2; Lighting Service, 2; Paving Service, 7; Sanitary Service, 3; Street Cleaning and Oiling Service, 8; Sewer Service, 7; Water Service, 12; Schoolhouse Department, 3; Supply Department, 1; Weights and Measures Department, 1; Mayor, 1.

From the above it might seem that Boston was well supplied with city passenger cars, but when we turn to the report from Los Angeles, Calif.,—a considerably smaller city, but one of greater distances,—Boston's supply of cars seems rather meager. Los Angeles writes: "There are 240 passenger automobiles owned by the city. There are, in addition, 130 passenger automobiles owned by city employes, which are used in city business and compensated for on a mileage basis when in city service." As might perhaps be expected, Detroit ranks high as a motorized municipality. That city reports a total of 616 pieces of motor apparatus. However, only a little more than half this number—315—are passenger cars. There are also 194 trucks, 56 pieces of fire-fighting apparatus, 51 motorcycles, 4 ambulances, and 3 tractors. These 616 pieces are allotted among the departments of Fire, Police, Public Works, Water Board, Parks and Boulevards, Health, Buildings and Engineering, Public Welfare, Recreation, Lighting, Library, Mayor's Office, Civil Service, Treasurer, Purchasing, Assessors, and Education.

There is a wide variation in the extent to which cities avail themselves of this modern instrument of efficiency. While all the large cities seem to be using passenger automobiles to some degree, some of the smaller ones are as yet wholly unsupplied. Freeport, Ill., in answer to the questionnaire, simply writes, "None," while Rock Island, of about the same size and in the same state, gives a list of 12 cars and 4 motorcycles in use by city departments.

Quite a number of the smaller municipalities do not own passenger cars outright, but make an allowance to employes for their use and up-keep. We have already noted the method of Los Angeles in this respect. Phoenix, Ariz., after listing 21 city-owned passenger cars, adds, "We also have an agreement with four or five city employes whereby they own their own machines." Winsted, Conn., owns no cars, but allows the Street Department Superintendent and the Water Department Superintendent each "$300 per year to run and maintain cars." Canton, Ill., says: "None owned by the city, but our City Engineer, also Township Engineer, and our Chief of Police have cars which the city helps maintain." In Taunton, Mass., "an allowance of about $500 per year is made to the Superintendent of Schools, the City Engineer, the Superintendent of Public Buildings, and the School Attendance Officer, each of whom owns and maintains his own car." Adrian, Mich., owns no cars, but "city officers all own cars; city gets benefit for nothing."

The larger cities own passenger automobiles in varying numbers and in proportions that vary widely as compared with their several populations. In general, it appears that as a rule the cities of Massachusetts and California are most liberally supplied. The reader can in a measure form his own estimates of the degree to which the larger cities are using this agency, by running over the following list: Birmingham, Ala., has 41 passenger cars. San Francisco has 104, and Oakland, hard by, 76. New Haven, Conn., has 61, and Hartford, 34. Atlanta, Ga., reports 52. Des Moines, Ia., has 23 and Kansas City, Kans., 33. Louisville, Ky., tells of 91. Massachusetts cities report: Cambridge, 12; New Bedford, 20; Brockton, 12; Lowell, 16; Worcester, 62; Lynn, 28; Springfield, 47. Some of the smaller cities of Michigan are especially well supplied: Lansing with 25; Battle Creek, 9, and Grand Rapids, 60. In the state of Missouri, St. Louis reports 87 and Kansas City 68. Many of the smaller cities in New Jersey are well supplied: as East Orange, 10; Montclair, 9; Elizabeth, 12. The reports from the larger cities of New York State are somewhat meager. Among those of lesser rank Albany reports 16, Troy 5, Yonkers 23, Niagara Falls 18, Utica 12, etc. The cities of Ohio are all fairly progressive in this matter of passenger car ownership and use. Dayton has 48, Akron 86, and others in similar proportion. Pennsylvania is not so well supplied. Pittsburgh has but 44, Reading 11, Harrisburg 7, and Easton 2. These are fair examples. Providence, R. I., lists 37, and Newport 1. In Texas, Galveston owns 16 passenger cars, El Paso 20, San Antonio 26, and Houston says: "Passenger cars are being used by the city of Houston in all departments except the Accounting Department, City Secretary, and Purchasing Agent and Market Master." In Virginia, Richmond reports owning 44 passenger cars, Norfolk 38, and 26 trucks, while her neighbor Portsmouth has 12.

In the 300 returns received almost every state and section of the country finds representation. The passenger cars used by the cities of this country number many thousands; exactly how many would be hard to tell, but one thing is clear—the number is rapidly increasing as city administration becomes more alert and efficient.

SWIFT AND EFFICENT POLICE PROTECTION FOR A CITY

The Sanitary Engineer as Health Officer

By E. G. Sheibley
Consulting Sanitary Engineer, Los Angeles, Calif.

MORE engineers should be engaged in public health work, as health officers, as members of health boards and as commissioners of health. Within recent months numerous articles have appeared indicating growing recognition of the fact that the sanitary engineer, because of his training and experience, is the logical executive for public health work. This suggestion may seem radical at first, inasmuch as the laws generally permit only practicing physicians to hold the office of city or county health officer. At the present time a sanitary engineer may act as deputy health officer, and as such may do the greater part of the actual work, but must be subordinate to the doctor of medicine who holds the office.

An analysis of the duties of public health officers suggests the advisability of reversing this relationship, and the propriety of naming an engineer as health officer, with a doctor of medicine retained in the position of an assistant or consultant in an advisory capacity. The duties of a health officer may be divided into three classes of work—medical, executive and administrative (business) and engineering. Perhaps ten per cent of the duties of a health officer require medical training, and of course no one would trust the judgment of any non-medical man in such problems as the diagnosis of disease and the prescription of treatment or medicine. As contrasted with this limited number of purely medical functions, probably fifty per cent of the health officer's duties demand an engineering knowledge and experience; while as a rule the general executive and administrative training of the engineer is superior to that of the practicing physician in practically every instance.

On every health board, state and city, the engineer and the doctor should have equal representation. The doctor of medicine is primarily interested in the cure of constitutional disease; the sanitary engineer is primarily interested in the removal of those environmental causes which are responsible for about one-half of the diseases of common occurrence. It is no reflection on the medical profession that only a few practicing physicians know the relative advantages of an activated-sludge plant and an Imhoff tank; while such questions, of concern to the community and its health officer, are part of the elementary knowledge of the sanitary engineer. It will be readily acknowledged that such matters as plumbing, garbage and refuse disposal, water-supply, sewerage and sewage treatment are problems solely in sanitary engineering, as contrasted with medical problems, which deal with health as centering in the individual, with communicable diseases as spread by infected persons, and with the keeping of records, making of inspections and the preparing of vital statistics.

Every indication points to an increasing public recognition of the value of utilizing the engineer in public health work to a greater degree than in the past; and it is plain that more and more communities will call upon engineers to occupy those positions in civic life for which their special training has fitted them.

Additional Snow-Fighting Equipment For New York

Residents of New York City and those who were visiting there in February, 1920, are mindful of the blizzards which completely tied up all surface transportation and the elevated railways for a period of very nearly two weeks. The regular street cleaning force, augmented as it was by all the hand labor that could be secured, was not sufficient to grapple with the problem of removing the vast sheet of ice which was firmly frozen to the pavements.

The city has recently purchased, in addition to a large number of motor trucks and small tractors, fifty 5-ton Holt tractors to help in the heavy work, and a Friedman "Snow-Leader," which ably demonstrated its ability to remove ice and hard-packed snow from the pavements last February.

Details of Water-Supply Improvements at Jacksonville, Ill.

By R. S. Rankin

Pearse, Greeley & Hanson, Sanitary Engineers, Chicago

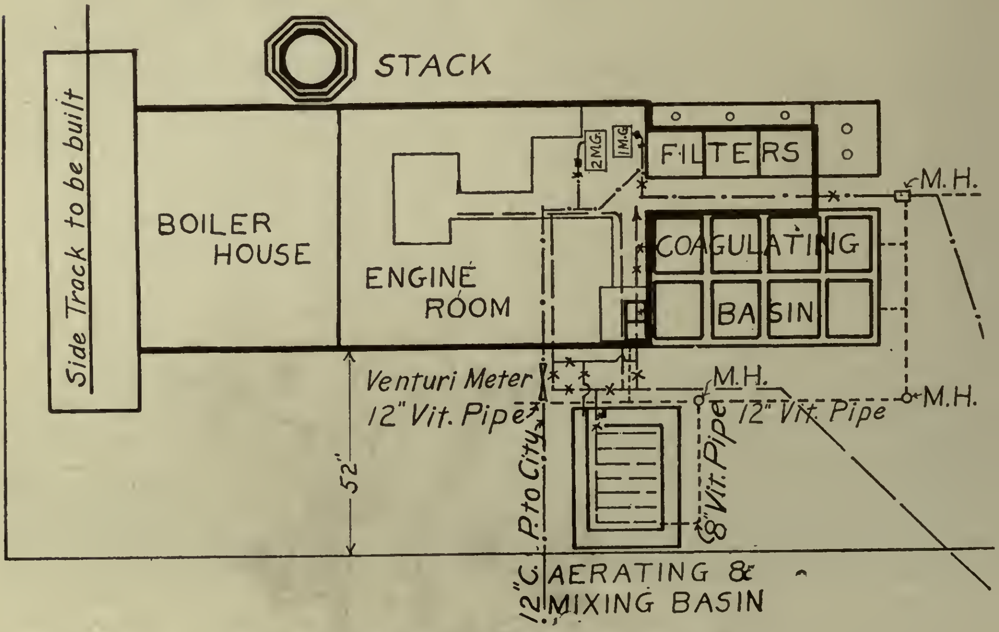
THE problem of securing an adequate water-supply for the city of Jacksonville, Ill., has recently been solved by the completion of a storage dam, and a filter plant now under construction.

Jacksonville, founded in 1825, is one of the oldest cities in the state and has had a water-supply problem for the last thirty years. The population of the city is about 16,000, and, in addition, there are some 3,500 persons in state and other institutions, which makes a total population of about 19,500 to be supplied with water. The water consumption has averaged about 1,250,000 gallons per 24 hours, or about 65 gallons per capita. The services are 100 per cent metered, which partly accounts for the low consumption. A great many inhabitants, avoiding the public supply, obtain drinking water from private wells and spring water companies.

History of Water-Works

The first water-works were constructed in 1869 and the supply was obtained from a small impounding reservoir. Shortly after, this was supplemented by another reservoir formed by a low dam within the banks of the south fork of the Mauvaisterre Creek. In a few years the supply was again deficient, and various sources have been sought ever since. Wells in various locations were sunk, one of them being over 3,000 feet deep, but with little success.

In 1905 a company agreed to furnish 3.0 million gallons a day from wells sunk in the Illinois River bottom-lands twenty miles distant. The company was never able to fulfill its contract, and the project was abandoned. In 1910, the city proceeded to develop a supply from shallow wells on the north side of the city. This source until recently supplied about one-third and the



PLAN OF NEW WATER-WORKS AT JACKSONVILLE, ILL.

CONSTRUCTION OF DAM AND RESERVOIR, JACKSONVILLE, ILL.

At the far end is shown the spillway, in the foreground the paved face of the dam, and at the right the intake tower

old impounding reservoir about two-thirds of the city supply. The quantity was inadequate and the quality very unsatisfactory. A number of the state institutions located in the city threatened to withdraw if the city did not take prompt steps to improve conditions. In February, 1918, the city called in the firm of Pearse & Greeley to report recommendations as to the proper solution of the problem.

Investigation for Extensions

Upon investigation, it was found that four or five streams in the vicinity of Jacksonville might be developed to yield an adequate supply. The drainage areas of these streams vary from 16 to 98 square miles, and the length of supply main required varies from a few hundred feet to about 6 miles. Extensive tests of the local wells by the city and the State Water Survey showed conclusively that the supply from them was limited to around 500,000 gallons a day. All things considered, it was finally recommended that a high dam be constructed on the south fork of the Mauvaisterre Creek adjacent to the old high-lift pumping station. Above this point, the drainage area is 24 square miles, with an additional 2.5 square miles supplying a small lake in the city park, which can be utilized if necessary.

The Impounding Reservoir

The amount of storage required and the length of spillway for flood flows were factors of design for which no data existed. No stream gagings had ever been made. A thorough study of other similar streams was made and the results modified and adjusted to local conditions. The average annual rainfall on the watershed is 35 inches and the average annual run-off is estimated at 9 inches. On this basis, a storage reservoir of 400 million gallons available capacity will yield a minimum of 2,000,000 gallons per day except in the very driest year, when the yield may be reduced to 1,500,000 gallons per day. The maximum flood flow is estimated at 4,500 cubic feet per second or 167 cubic feet per second per square mile. Assuming a 4-foot overflow, a spillway 160 feet long is required.

An earth dam was selected with compacted clay and a puddled clay cut-off wall extending about 16 feet below the bottom of the dam. The spillway channel is excavated in the side hill and the material used in the embankment. The length of the dam along the top is 600 feet and the width is 10 feet at the top. The down-stream slope is 1¾ :1 and the upstream is 3:1, with 6 inches of concrete pavement on 9 inches of gravel extending from a toe wall to within 6 feet of the top. The dam is 22 feet high above the general level of the valley. The spillway is 160 feet long and is a concrete sill with paved up-stream approach. The spillway channel is about 450 feet long and has 1½:1 slopes paved with 6 inches concrete 10 feet up the side hills. The channel narrows to 65 feet in width at the bottom, thereby using up some of the velocity head and lessening the scouring velocity. The outlet is flared on a 30-degree angle, and the floor drops down 5 feet, acting as a cut-off wall to prevent undermining. The crest of the spillway is set 8 feet below the top of the earthwork, thus providing 4 feet free-board during maximum floods. The reservoir formed floods about 240 acres and has a maximum depth of 14 feet and an average depth of 5.7 feet.

A concrete gate house and conduit are located near the center of the embankment. The conduit was used during construction to take care of the ordinary stream flow and now carries the pipe lines through the dam to the filter plant.

The contract for the dam was let in April, 1919, to the John T. Walbridge Engineering & Contracting Company, of Chicago, for $58,887. The actual cost was $54,100, or $125.60 per million gallons of storage capacity. The itemized costs are as follows:

Earth fill, 28,453 cu. yd. at 50 cents......	$14,226.50
Excess spillway excavation, 3,517 cu. yd...	1,406.80
Stripping, 3,104 sq. yd. at 69 cents......	1,862.52
Core puddle wall, 1,666 cu. yd. at $2.00..	3,331.80
Conduit and gate house	9,300.00
Slope paving, 4,000 sq. yd................	....
Slope paving, 1,123 sq. yd................	7,754.00
Spillway $21,000, less 5,313 cu. yd. at $9.00.	16,218.30
Total	$54,099.92

The reservoir has been in service since the fall of 1919.

Filter and Electric Light Plant

To complete the project, a filter plant and an electric light plant are now under construction. The filter plant consists of an aerating and mixing basin, a coagulating basin, three half-million-gallon-per-day filters, a filtered water basin, and the head house and pumping station.

The aerating and mixing basins are combined into one basin 26.5 x 36.5 feet and 2 feet deep. Around the inside and 4.5 feet distant from the outside walls is a 6-inch concrete wall. This forms a passageway which is baffled and constitutes the mixing basin. The inside rectangular area has 7 rows of 6-inch pipe 14 feet long, into which are tapped 28 nozzles. This forms the aerating basin.

The coagulating basin has a capacity for 2 hours settling at the 1.5-million-gallon rate. It is an open concrete structure 10 feet water depth, with a center baffle wall extending three-fourths of the way across. Down the center of the two passageways thus formed and in the floors are two gutters 6 inches deep. Spray pipes along the side walls at the bottom directed towards these gutters enable much of the sludge to be removed without emptying the basin. The effluent passes over a concrete weir set about 9 inches under the normal water level.

The three filters each have a sand area of 12 x 14½ feet. The gravel is 15 inches deep and the sand 30 inches deep. The underdrains are of the Harrisburg type with 2½-inch lateral running at right angles to a central cast iron manifold of special design. This manifold is placed in a false concrete bottom of the filter and leaves no dead space in the center.

Underneath the filters is the filtered water storage reservoir, which has a capacity of 1.12 hours at the normal rate. This is small on account of an elevated reservoir in the city, holding over a day's supply. The walls of the filtered water basin are 8½ feet from the walls of the coagulation basin, and the space is utilized as the pipe gallery.

The head house and pumping station join the pipe gallery at one end. Two high-lift electric pumps were already owned by the city, and these were put in the new pump house. An existing low-shift steam pump will be used to supply water to the aeration basin under pressure. Washing the filters is to be done by means of a pressure-regulating valve placed on the discharge of the high-lift pumps. This was necessary, as the city did not have sufficient funds to install a wash water pump or tank. The chemical solution tanks are placed on a balcony in one corner of the pump room. The generator room of the electric light plant adjoins the pump room, and, beyond this is the boiler room.

The contract for this work was let in April, 1920, for $65,137, to the John T. Walbridge Engineering & Contracting Company, of Chicago.

The City Manager Plan "Exposed"

Do You Recognize Any of the Arguments?

EDITORIAL NOTE:—*This satire on the opposition to the city manager form of municipal administration, from an address by M. F. Manville delivered before the Lion's Club in Ada, Okla., will be appreciated in every community which has discussed this kind of government.*

THE proof of the pudding is in the eating of the same and not in chewing the strings of the bag wherein the said pudding was cooked. The data from which my deductions are obtained is a publication put out by the City Managers Association, an organization in New York City. I consider the deductions I have made natural and customary in our political life.

Candor compels me to say that I give this as the opinion of one opposed to the managerial idea.

The fact that this pamphlet comes from New York City is enough to put one on notice. How far is this office from Wall Street, that famous den of iniquity? I cannot say. The booklet states that it is a part of the Fifth Year Book. Who is paying for this and the four which have preceded it? Somebody is, and that person is expecting something in return. People do not give away something for nothing. When you hear of people giving up good money for the benefit of somebody else, look out.

There are in this booklet reports from 85 towns in 26 states which have tried out the managerial idea. Let me call your attention to the significant fact that the sum of the two digits in 85 is 13 and that 26 is twice 13 and is the skiddoo number. Any reasonable man knows that these thirteens are portentous.

It is significant also that New York City, whence this publication comes, the home of this association, is not given among the 85 towns who have city managers. Evidently they prefer Tammany Hall. Neither is Chicago, which prefers Mayor Thompson's rule. It does not look good to Philadelphia, the City of Brotherly Love, nor St. Louis nor San Francisco. Even Oklahoma City has achieved its thirty-five gaily caparisoned mounted police without the services of a city manager. The largest city given is Grand Rapids, Mich., with 150,000 population, and with a declining scale it reaches Largo, Fla., with 500. One-half of these towns have less than 10,000.

Having given these preliminaries, let us consider what a city government is for as evidenced by the achievement of these 85 conceited prodigies who turn from the principles adopted and practiced by our fathers and sail the uncharted sea of a managerial form. The commission form with its non-partisan idea is bad enough, and must have sprung from a mind unbalanced by belonging to a minority party that saw no hope in the future, and sought office via the citizen's ticket or the non-partisan route. The non-partisan idea is contrary to the Bible, as is this manager business, both of which seek "to muzzle the ox that treads out the corn."

What can be the reward of party fealty if the plums are to go to any but the faithful who have borne the heat and burden of the day? Where would these United States be if we had followed that idea? Who are we to spurn the examples of Jackson, Calhoun, Mark Hanna, Frank Hitchcock, Gore and Williams? Such luminaries as these have watched over our destiny, and to-day the United States is the greatest nation in the world. [Pause here for applause.] Wise counsel says, "Let well enough alone."

We must look the facts in the face. We all belong to some party and we are for that party. Our governmental system is built to conform to that idea. Party success is founded on party labor, and party labor is, and must be, paid for with political jobs. If you want to overthrow the republic, abandon partisan politics.

What Are the Benefits?

Now let us get down to cases, as the lawyers say. What great reforms and benefits do these people boast? What great things might we expect at the hands of the city manager? The following are not the emanations of a jaundiced mind. I do not look with distorted vision, I merely give you what they themselves say. One says, "We have installed municipal bath-houses." They fail to state what night is bath night; and what is the penalty for failure to report to the city manager for ablutions. Gentlemen, in these days when personal liberty has become a byword, and pantry, closet and cellar may be invaded with impunity, it makes the heart sick to see still further inroads on our personal rights. Can you not see in the not too distant future some fireside where sits a weeping wife, bowed with grief, her children clinging to her skirts crying, "Oh, mother! Where is father tonight?" only to learn that he has been torn from the bosom of his family and ruthlessly hurled by a brutal city manager into the municipal vat?

Another boasts a reduced tax rate, another money saved, and another a cash balance in the bank. Heavens! what next? My friends, what is a government for, pray tell? Past and present both speak the answer—a government is to spend money. It is not a savings bank any more than it is a bath-house, or a nursery. The more you spend, the greater the government. Good government costs good money and lots of it. The more you spend, the greater the government; for example, look at the dear old U. S. A.!! [More and more applause.] Do you want men to raise up a generation of tightwads? Finances are a simple matter. The banker may tell you different, but that is only to cloud the issue so that he can charge you a higher rate of interest or draw the mortgage tighter. Finance is easy. The more taxes you collect, the more money you have to spend. If you do not get it to spend, it is because you did not vote right, which is your fault and not that of the partisan system. Get in the band-wagon.

Some cities have established hospitals. They do not say anything about undertakers, but that is probably understood, and comes under the head of protective improvements for next year. Some have employed city nurses and have even established dairy stations for baby milk. I suppose the city nurse is to hold the manager's hand when he is not employed in looking after somebody's personal bath habits or looking up some property that has escaped taxation. As to the supplying of babies with milk, the said city manager is selected, I presume, with reference to his experience and skill in fixing the baby's bottle.

One newly elected manager drafted and passed two ordinances, one to prevent the posting of political advertisements on trees and poles. This certainly is in strict violation of the liberties granted under the constitution. The other ordinances required the dairies to be whitewashed and the cows scrubbed. I have heard of whitewashing an administration when it is over, but this is certainly a plea of guilty before the offense to begin with a coat of whitewash. What perils would certainly attach if a citizen moved from one town to another! In one town his cow was scrubbed and in another he himself the victim. When he saw the city manager coming up the street with the Gold Dust Twins he wouldn't know whether it was he or the cow that was going to get it.

Now who advocates this new system? Is it the weary and toilworn wage-worker plodding home after five hours of toil bent under the load of his day's wages? Does he turn in at the city hall, asking to have his toe-nails manicured and his cow whitewashed? No. It is the white-collared crowd who hob-nob in the hotel, leaving their wives at home unprotected and unfed who seek to wish off on the unsuspecting public the city manager.

One city of over 50,000 held public dances on the smooth pavement, and their own statement says, "There were 5,000 present and everybody danced." Comment on this feature alone would prolong this meeting past the supper hour. Even the selling of necessities during the war-time when prices were prohibitive—potatoes at 50 cents per bushel under the market, and fish daily imported and sold at 10 cents per pound under the market—and the developing of near-by coal fields during the fuel famine to save the people from starving and freezing, is no virtue if they danced themselves warm.

Such, gentlemen, are the arguments against the managerial system. Were I an orator with the gifts of some of our officials I might paint the scenes plainer, but they would be no different, and what I have said here in a crude way is what you will meet when you advocate this new system. I have not and could not anticipate all the arguments against this thing, but I venture to say that any others will merely differ in detail and not in substance.

Forward Steps
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

Mayors

"Come Again Soon"

Minneapolis, Minn.—Ten thousand automobile tourists have a warm spot in their hearts for Minneapolis this year. The Tourist Welcome Committee, organized by Mayor J. E. Meyers, has extended a welcome to visiting motorists that for unique method and warmth of reception has seldom been equalled. At least, so the visitors themselves say.

The Mayor has always preached the gospel of hospitality and the square deal to the automobile tourist, believing that each satisfied motorist will not only return another season, but will bring others with him. The states of the Pacific Coast have realized the immense legitimate profit that comes from tourist trade. California, for instance, spends a million dollars a year advertising for tourists, and reaps profits of several millions. There is really no reason why other states cannot do likewise and cater to the tourist rather than discourage him with high prices and heavy fines for minor traffic violations often committed in ignorance.

1920—MINNEAPOLIS—1920

The Mayor cordially invites you to the Gateway Building on Washington Avenue at the junction of Hennepin and Nicollet, where you will be presented with a Complimentary Souvenir Tag for your car, conveying the official hospitality of the city, together with information that will be valuable to you during your sojourn in Minnesota.

20000 J. E. MEYERS, *Mayor*

In planning the details of the welcome, the first problem was to reach the tourist as he arrived in the city. Each traffic officer was supplied with a pad of invitations, with instructions from the Chief of Police to hand an invitation to each motorist whose license tag showed him to be from some other state. Obviously it was impossible to distinguish the tourist from within the state who happened to come to Minneapolis. The invitation read as on the card below.

The tourist would then drive to the Gateway, a beautiful building in the down-town district, built by the Park Board, where the committee had its headquarters. Here the visitor was asked to register name, residence, destination, state automobile license number, and the number on the complimentary visitor's tag which was given to him by the executive secretary in charge.

This tag is of metal about three inches square with white lettering on a blue background, and is reproduced on page 494. A Boy Scout, stationed at headquarters, wired the tag to the radiator of the car, and the driver thus equipped immediately became officially a guest of the city and was to be treated with the utmost courtesy. The tag was practically a key to the city and meant that if the motorist was guilty of some minor infraction of the traffic regulations, he was let off with a warning and not arrested. The Mayor reasoned that it is impossible for visitors from other states to become familiar at once with all state and local traffic regulations, and therefore they were to be granted a few privileges.

In addition to the complimentary tag, the tourist was given a large envelope containing maps of roads in the state, motorist's manual, summary of Minneapolis traffic regu-

THIS TAG IS AFFIXED TO THE VISITOR'S CAR

lations and other material of interest and value to strangers. Should the tourist desire any other information, Mrs. A. L. Hazer, the executive secretary, was prepared to give it. A thousand and one questions were asked her every day, ranging from queries as to conditions of roads in every part of the country and the way to reach a certain hotel in the city, to a request to find a minister who would perform the marriage ceremony for a visiting couple.

To encourage the policemen in giving out invitations, the Mayor started a prize contest to determine as nearly as possible which officer handed out the most. The invitations were serially numbered and each pad checked off to the officers to whom they were given, and again checked when turned in at the Gateway by the visitors. Cash prizes of $25, $20 and $15 were recently awarded to three officers, and seven other policemen were given merchandise orders donated by business men.

Iowa furnished the largest number of visitors this season, its total being 1,099; Wisconsin and Illinois came next, with 853 and 443 respectively. Nearly every state in the Union was represented, and there were a large number of visitors from Canada and a few from foreign lands, Norway and Hawaii among them. Funds with which to carry on the work were raised by the five committee members from business men whose houses were especially benefited by tourist trade.

That the plan has worked out well is evidenced by the large number of appreciative letters sent by visiting tourists, and also the many unsolicited newspaper editorials from all parts of the country. This method of welcoming "the stranger within your gates" may well be followed in other cities, though the Mayor recommends that such a program be worked out as a statewide movement rather than by separate municipalities.

ARVID A. ERICKSON,
Secretary to the Mayor.

THE GATEWAY TO MINNEAPOLIS, WHERE VISITORS ARE WELCOMED AND MADE TO FEEL AT HOME

Park Departments

An Experiment with an Amusement Park

FORT WAYNE, IND.—The Board of Park Commissioners of Fort Wayne, Ind., has undertaken an experiment that will be watched with much interest by all the park boards of the country. A concession for a privately owned amusement park has been introduced into one of the public parks.

Until recently, the street car company of Fort Wayne has maintained an amusement park, located about seven miles from the city. It has been a valuable asset to Fort Wayne, not only as a pleasure resort but in a business way. It has been conducted in a clean, orderly manner, all objectionable features being kept out, making it an amusement park where our citizens have always felt free to go themselves and to send their wives and children for a day's outing in the woods. It has annually brought many Sunday School and other excursions to our city from surrounding towns.

The announcement of its discontinuance, because not profitable at so great a distance from the city, called forth a general expression of public regret, especially from the younger generation. The Board felt that it was important that the boys and girls and the youth of Fort Wayne should be afforded such a park, with its varied and innocent amusements; and so, with some misgivings as to the result, it decided to try out the experiment of granting an amusement park privileges in one of our larger near-in city parks. A very careful selection was made of the person to whom the permit was to be granted.

He has erected an expensive dance pavilion, 150 by 200 feet in size, and capable, if fully occupied, of accommodating 1,400 couples at one time. A charge of five cents is made, with one additional cent for Government tax, for each dance, the floor being cleared every six minutes. Dressing room and other privileges are provided for both men and women. For some years the holder of the concession has very successfully conducted a like pavilion on the grounds of the street car company's park, which has always been so carefully managed as to command the patronage of the best young people of our city. He also has erected a large refectory and shelter pavilion, about 125 feet square, which is free to everybody. He has established a pony circle, a merry-go-round, a whip, a roller coaster, a ten-pin alley, a photograph gallery and similar attractions. All games of chance are, however, forbidden. His concession includes all drink and lunch privileges, and for these, suitable buildings have been provided. A band stand has been erected, from which numerous band concerts will be given, free, of course, to all. No fences are permitted, except about the pony circle and the "kiddie" and children's playground. For the use of the last two no charge can be made. The grounds and buildings are brilliantly lighted and carefully policed.

THE FORT WAYNE PAVILION ACCOMMODATES 1,400 COUPLES

The location of the buildings is about one-eighth of a mile from any houses, so that the music will not be annoying to near-by residents. The Board of Park Commissioners reserves the right to make the rules regulating the use of the privileges granted. The person holding the concession has invested or will invest the sum of $75,000 to $100,000. The Board reserves the right to cancel the lease or concession at any time, but if it does it must purchase the buildings at a reduction of three per cent on their cost for each year they have been in use. The lessee pays an annual rental of $3,150.

Dancing has thus far been permitted Sunday afternoons and evenings. Some objection to this has been made, but as our theaters are all open on Sunday, league ball played at League Park, numerous ball games on the diamonds in our parks, swimming pools in use, tennis courts crowded, the Board is inclined to think the dance pavilion ought not to be closed against the men and women shut up in stores and factories on week days.

Thus far our experiment is working out admirably.

D. N. FOSTER,
President of Park Board.

Public Works Departments

Milwaukee Regulates Its Motor Traffic

MILWAUKEE, WIS.—The tremendous growth of motor transportation has seemingly caught our municipal legislators unaware and unready to cope with the problems arising out of it. The relation of public safety to motor and pedestrian traffic is a very important one. The effect of the vibration of rapidly driven trucks upon privately owned buildings along heavy traffic streets has caused a great deal of complaint. Finally, the city is finding that its streets and bridges are being constantly worn out from this traffic and that property owners are objecting to paying the expenses of reconstruction.

Milwaukee has been realizing this problem for some time and has attempted to meet it with regulatory legislation. In 1919 the Wisconsin State Legislature gave authority to cities to designate certain streets as heavy-traffic arteries and to prohibit the use of other streets for this purpose. This legislation included the fixing of minimum requirements for headlights as sufficient to enable the driver to distinguish clearly a person, vehicle, or other substantial object two hundred feet distant, and granted the Industrial Commission of Wisconsin authority to fix standards of lighting such as to avoid dangerous glare or dazzle. This Commission, after extensive investigation, has issued general orders upon automobile lights and lighting. The city of Milwaukee is now contemplating the creation of a division of automobile testing and the establishing of an automobile headlight testing station.

The most important state legislation, however, was the passage of the law regulating the capacity, dimensions, speed and equipment of motor trucks, trailers and tractors. This legislation has been reenacted with certain more severe restrictions by the Milwaukee Common Council. The city ordinance was proposed in the Common Council, and, after public hearings, submitted to a committee appointed by the truck owners for suggestions as to changes. The recommendations of this committee were followed except as to those regarding speed limits.

The most important features of this ordinance are the limitations of the speed of motor trucks equipped with pneumatic tires to 15 miles per hour, of trucks equipped with solid tires to 12 miles an hour, of vehicles equipped with metal tires to 6 miles an hour, of trucks weighing over 14 tons, including the weight of the vehicle, to 8 and 10 miles an hour, and of metal-tired trucks weighing over 3 tons to 3 miles an hour. The trucks are required to come to a full stop at least 10 feet behind a street car discharging or taking on passengers. Truck users are required to equip their trucks with a standard speedometer, to have it in good working order at all times, and to have their brakes inspected once a week by some qualified person. Trucks fitted with solid rubber tires must be reequipped whenever the tires are worn to within one inch of the rim. The loads of motor vehicles are limited to 1,000 pounds for each inch of width of tire upon any wheel, with a maximum restriction of 30,000 pounds as the maximum weight of any vehicle and load, and of 24,000 pounds as the maximum weight upon one axle. Motor vehicles are restricted to 115 inches in width and 30 feet in length, except that the combined motor truck and trailer may be 70 feet.

As a matter of identification, each vehicle is required to carry the name of the owner or operator printed in letters capable of being read at a distance of 200 feet, with the provision that the user of more than one motor truck must number each one and have the number printed on the truck in addition to the name. Violators of any provision of this ordinance are subject to a fine of $100 for each offense, and the operation of any truck violating the ordinance is stated to be a separate offense for each day of violation.

PERCY BRAMAN,
Deputy Commissioner of Public Works.

Public Welfare Departments

Fresh Fruits and Vegetables for the City Dealer, and Ready Money for the Farmer

MEMPHIS, TENN.—During the past summer Memphis has enjoyed the benefits of successful open air city markets at Forrest Park and Market Square. The markets were opened under rather discouraging circumstances. The idea was novel, and the general farmers, though enthusiastic, had very limited quantities and variety of fruits and vegetables for sale at that season; besides, they were somewhat unfamiliar with retailing this class of produce. Because of high labor costs and very large crops, many local market gardeners found that they could not in most cases profitably sell in small lots through the retail markets, and therefore continued to sell to wholesalers or to established grocers. This made the city markets largely dependent upon the farmers who lived at a considerable distance from town, but who could come regularly. For years these farmers have stuck closely to the cultivation of the "old reliables"—cotton, corn and hogs—raising vegetables only for their own use. This kind of agriculture has disadvantages, as the farmer has little cash income except at the period of selling the cotton crop. With these men the chance to turn the tri-weekly trip to the city into ready money made the markets very popular.

The markets were held in the open air, and about forty farmers who came in regularly on Tuesdays and Thursdays with considerable assortments were assigned to permanent locations along the curb. On Saturdays some thirty or forty more came in, a majority of these being the country people who live beyond the first circle of gardeners. They were general farmers. As they usually came to town anyway on Saturdays, they searched the farm and brought in what they found. This was not produce grown especially for trade; it was planted before the growers knew there were to be retail markets. It was surplus produce, which Memphis needed, but which would not have been received had it not been for the operation of the city markets.

These farmers have been highly pleased with the enterprise. It is a novelty, but it looks good. They lose some time out of their visit to the city, but they feel that they are in touch with an opportunity that will offer them a year-round market for everything they can grow, and that they will not have to wait for pay-day once a year in cotton picking time. These men came in with no scales, no measures, no equipment of any kind, and with little idea of retail prices for their wares. But they were willing to learn what to get, where to get it and how to make use of it.

BUYER AND SELLER PROFIT FROM THE MUNICIPAL MARKET

MOTOR TRUCKS LINK THE COUNTRY TO THE CITY

The Motor Truck a Partner in the Enterprise

Not only has this market brought quantities of fresh fruit and vegetables within easy reach of the inhabitants of the city, but it has been an important factor in bringing Memphis and the surrounding country into closer contact. It has promoted the sale of motor cars, with all that implies in relieving the monotony of rural life and in raising rural standards. When a man, with two mules, spends three hours coming to the city with his produce, thirty minutes in selling it, and three hours in getting back home, he learns the relative value of time. He buys a truck and reduces his travel time to thirty minutes each way—and enjoys the trip.

It is not expected that this method of marketing will drive the wholesale vegetable grower or dealer or the corner grocer out of business. The larger growers will continue to feed Memphis, but their produce can be supplemented by that offered in the city markets, supplied by the small nearby gardener and the farmer who has a surplus to sell. The market has demonstrated its value, and a still more successful season is anticipated for the coming year.

J. H. TULL,
Superintendent of Markets.

Recreation Departments

Summer Swimming Pools in Los Angeles

Los Angeles, Calif.—For the past two summer seasons the Playground Commission of the city of Los Angeles has operated an open air swimming pool at Exposition Park. The plant consists of two open air concrete tanks each 50 feet by 125 feet, varying in depth from 2 feet 6 inches to 8 feet. In addition to these tanks, there is a small circular wading pool, an administration building, dressing rooms for men and boys, and one for women and girls. The corps of employes consists of director in charge, three life-guards on the job at all times, two dressing-room attendants, one cashier clerk, and one distributing clerk. The plan of operation provides for one swim in the morning from 10:30 to 12:00,

COULD YOU TAKE THIS PICTURE IN YOUR CITY?

two swims in the afternoon from 1:30 to 4:30, and one swim in the evening from 5:30 to 7:00. There is a complete change of bathers at each period, thus making provision for a large number of individuals in one day, also eliminating the possibility of too much swimming on the part of those who do not fully realize the dangers resulting from too much exposure in cold water.

Last year we accommodated some 56,000 people in 100 days, averaging throughout the season 560 swims per day. The prices charged are as follows: boys and girls under 12 years of age, 5 cents per towel and 5 cents per suit, with the privilege of bringing their own bathing suits; persons 12 years and over pay 10 cents and 15 cents for the privilege of swimming in the pools. At the end of the season our surplus balance, after meeting all operating and maintenance expenses, was less than $100, thus showing that the service was rendered at a cost that would barely meet the actual operating expenses.

Particular attention was paid to the physical safety of the bathers, and through the constant, careful watching of lifeguards there has not been a serious accident of any kind at this plant in the last two years. The matter of sanitation is under the careful observation of the State and City Health Departments, and we employ the most modern method of water treatment through the application of chemicals, as outlined by these authorities. A soap shower is required of bathers before entering pools. We have had no case of disease develop, so far as we know, through the use of this swimming pool.

As a result of the success of the pool at Exposition Park, the city has this summer conducted six other pools—two outdoor pools, three indoor pools—one belonging to the Playground Commission and the other two housed in school buildings—and a third open air pool, made possible through the surfacing of an old school basement.

C. B. RAITT,
Superintendent, Playground Department.

Davenport Starts a Municipal Playground

Davenport, Ia.—This city, with a population of 60,000, has never had a municipal playground. The new administration, upon taking office, decided to build municipal playgrounds in various sections of the city.

The first one to be built, namely, the Lincoln Municipal Playground, is located upon a site deeded to the city by the U. S. Housing Corporation and is immediately adjacent to the Government Housing Development of 200 houses for war workers employed at the Rock Island Arsenal. A comfort station costing $700 was built. Play apparatus costing $1,000, consisting of slides, swings, teeters, two tennis courts, two baseball diamonds and circle swings have been installed. A large concrete-bottom wading pool, oval in shape, 66 feet by 88 feet, having an 8-inch depth of water at the edge and 25 inches of water at the center, was also built. There is a 6-inch drain in the center of pool which will quickly empty the pool for cleaning. There is a continuous 1-inch stream supplying the pool at the opposite ends from the overflow pipes. The pool is surrounded by a sand beach 15 feet wide. This pool has proved very popular with the children.

TO CHILDREN, THE POOL BRINGS HAPPINESS WITH SAFETY

All of the work of installing the playground apparatus and the building of the wading pool was done by city laborers. The pool contains 108 cubic yards of concrete, and the cost, complete, including the plumbing, grading and sub-drainage, was $2,400. This work, if let out by contract, would have cost about $4,500. The pool was designed by Roscoe K. Earle, engineer.

GEORGE KASPKE,
Chairman of Playground Committee.

Modernizing a County Surveyor's Office

By E. A. Gast

County Surveyor, Hamilton County, Cincinnati, Ohio

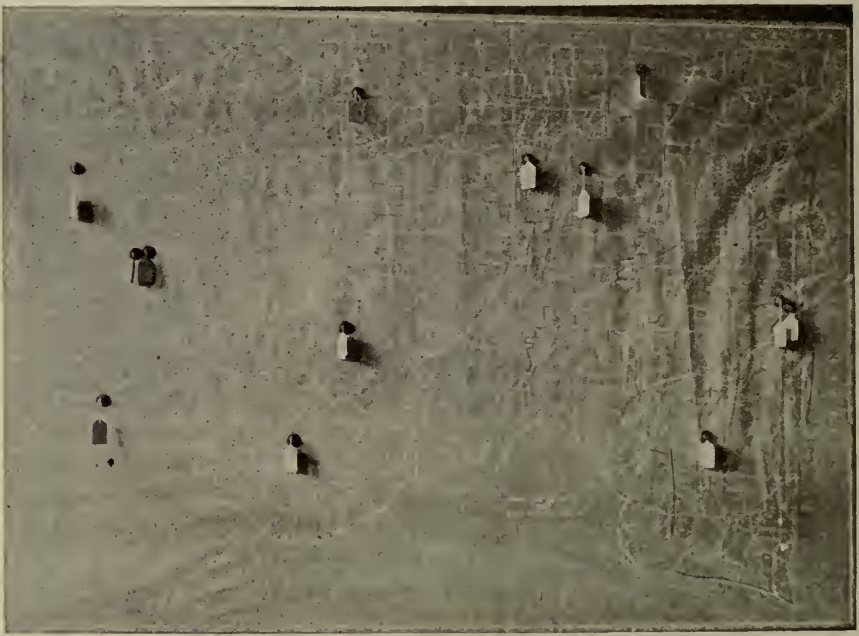
EXTENSIVE rearrangement and thorough modernization of methods used in the Hamilton County Surveyor's office were undertaken when the writer assumed charge in September, 1919. At about that time we moved into commodious quarters in our new three-million-dollar court house, which had just been completed.

Older ways of keeping records and carrying out routine work have been giving way rapidly to more efficient methods in all sorts of industrial enterprises, and there is every reason for the adoption of similar improvements by those in charge of public business. The results already obtained in Hamilton County in connection with work on our highway system have convinced us of the wisdom of these changes, as we have installed much more accurate methods and have developed a complete system of cost keeping.

A desire for accurate information on the cost of the maintenance and repair work carried out by county forces on highways and bridges was one of the influential factors in leading us to adopt the tabulating machine system used by the United States Census Bureau because of its great flexibility for recording and tabulating data under a large number of classifications.

The Tabulating Machine System

Under this system, complete information on any particular job is recorded by punching holes in cards specially ruled and printed, according to an established code. The punching is then checked by a second operator who places the card in the verifying machine, and proceeds as though punching a new card. If the carriage fails to advance when a key is struck, it means that either the original operator or the checker has made an error, and the mistake is at once found. At any time a package of these cards can be sorted automatically according to any desired classification, and then any



THE PLANNING OF COUNTY WORK IS MADE EASY BY THE TAGS ON THIS MAP, SHOWING AT A GLANCE THE EXACT LOCATION OF EVERY PIECE OF WORK IN HAMILTON COUNTY sets of figures on the cards can be added by the tabulating machine. In order to sort the same cards into other groups, it is necessary only to change the connections on the electrical switchboard that controls the mechanism. Sorting is accomplished through a magnet which attracts bars attached to flexible tracks. A brush passes over the card as it is fed into the machine, and an electrical contact is made through the card at the point punched. The current then actuates the magnet, which attracts certain of the bars so that the card passes into the proper rack.

For example, the total labor time on all the work in the county for any day can be secured, or the total labor time on any one road throughout the entire season can be found just as easily. Or the cost of maintaining cracks and joints on any stretch of concrete paving can be had, including materials, labor and motor car charges, each taken from different groups of cards.

OUTER OFFICE OF COUNTY SURVEYOR

The conveniences at the disposal of contractors in Hamilton County court house increase the facility with which bids are prepared and eliminate lack of information as a source of error

Before the writer became County Surveyor, all automobiles and trucks used on county work were hired by the day. As the need for motor vehicles was nearly continuous, it was thought that greater economy would result if the county operated its own machines, so nine touring cars and nine light trucks were purchased. Complete cost records, kept with the aid of the tabulating machine, prove that this step was well justified.

Service Recorder for Motor Vehicles

In order to secure an accurate record of the operating cost of the various motor vehicles owned, each was equipped with a service recorder. A circular paper dial with a waxed surface is inserted in this device before each trip. On this dial there is marked by a metal point a band composed of parallel lines which indicates the exact time the engine was started and when it was stopped. The apparatus is actuated by a clock mechanism, so that actual times are indicated. Vibration caused by the engine when running makes the point register.

On each of the dials at the end of the day or trip, notes are made as to the gasoline and oil used, repairs made, code number for the man operating the machine, and the division against which the charge should be entered. These charts are then sent in to the central office, where the data are transferred to blue cards by punching holes in accordance with our code. Whereas it formerly required three days' time to prepare a monthly automobile statement, giving mileage and cost of operation for each car, it now takes but three hours.

Records of Work Done

Hamilton County, through the Road Repair Department of the Surveyor's office, maintains 750 miles of road. For this work the county is divided into the four divisions of Western, Cheviot, Glendale and Eastern, and the Road Repair Department operates through a superintendent in charge of each division. The superintendent has under his supervision several gangs, each working under a foreman, and the work is carefully planned to secure efficient results. The usual force during the summer months consists of 12 foremen, 72 laborers, 21 trucks, 4 light touring cars and 4 gasoline road rollers. So far, practically no construction work has been undertaken by county forces, as we believe that under normal conditions the contract system is economical and a satisfactory method to pursue.

An accurate and up-to-date record of the location of the repair gangs is kept with the aid of a large blue-print map placed behind a glass cover, on which small rubber suction caps are shifted each day to show where each foreman has his men at work. Every road, bridge and culvert in the county has its number, which is shown on this blueprint. Tags on the suction caps are numbered to correspond with the numbers given the foremen, and this makes possible the use of a code all the way through in submitting daily reports to headquarters.

A complete filing system has been developed for keeping information as to work done on the various roads and bridges. Each has a card, filed according to number, on which data are entered showing in detail the cost and extent of all work done. In installing this system, we took from the records important data as far back as 1910, and transferred them in concise form to the cards.

In order to increase the facility with which contractors may prepare their bids, we have one room largely devoted to their use. Here they may examine plans and specifications at their convenience, and secure such other information as we can furnish. We also have a special room in which the surveying instruments are kept, with facilities for the use of our field engineers and inspectors when in the office.

These examples will serve to illustrate the steps that have been taken to put the County Surveyor's office on a strictly business basis. While everything has been systematized, we have kept in mind the great value of simplicity, and unnecessary red tape has been eliminated. In use, our plans have proved entirely practical, and we feel that increasing benefits will be secured as a result of their adoption.

Trenching Machine Experiences

Worcester, Mass., Owns a Machine and Rents It to Other Municipalities

By George W. Bachelder
Water Commissioner, Worcester

THE trenching machine in use in Worcester is a model O purchased of the Austin Machinery Corporation in 1913 at a cost of $7,000 less 5 per cent. It is operated by steam and was selected in preference to the gasoline machine because of the belief that there would be less trouble in securing operators who could handle a steam machine.

It has buckets of 18, 24, 30 and 36 inches in width, and in each case the cut made is 6 inches wider because the teeth project 3 inches on each side. Trenches can be cut much wider than the buckets by barring down the material on each side of and in advance of the buckets.

The ordinary depth to which the machine cuts for water pipe in Worcester is 5 feet; this, of course, can be made more or less, ranging from 0 to 12 feet.

Best results are not obtained at the extreme depth, because the boom runs so nearly vertical that the buckets spill much of the material before it reaches the conveyor belt. Cuts have been made for a 48-inch pipe line, with excellent results. The machine has developed no weakness, though it has been used in very hard digging.

It has done all of the trenching practicable in Worcester streets and has been rented to municipalities and contractors in Hartford, Conn., Quincy and Dartmouth, Mass., and is now in operation in Auburn, Mass. Given a straight run in localities free from obstructions, the machine is at its best and has cut hundreds of feet of trench in a day. For use in the installation of new water or sewer systems in any soil except rock, it will go ahead so fast that the problem is to keep the pipe laid within hailing distance.

Examples of its work are shown in these records:

HARTFORD, CONN., 1917

June 26, New Park Avenue, 155 feet long, 36 inches wide, 5 feet deep, 5 hours
June 27, New Park Avenue, 200 feet long, 36 inches wide, 5 feet deep, 6 hours
July 6, New Park Avenue, 220 feet long, 36 inches wide, 5 feet deep, 7 hours
July 19, New Park Avenue, 320 feet long, 36 inches wide 5 feet deep, 8 hours
July 24, Quaker Lane, 408 feet long, 24 inches wide, 5 feet deep, 8 hours

THE WORCESTER, MASS., MACHINE AT WORK ON WATER-MAIN TUBE

AUBURN, MASS., 1920

August 18, very coarse gravel, 410 feet long, 24 inches wide, 5 feet deep, 8 hours
August 19, loam, hard-pan and gravel, 250 feet long, 24 inches wide, 5 feet deep, 5 hours
August 20, hard-pan, clay and sand, 380 feet long, 24 inches wide, 5 feet deep, 6½ hours
August 21, sand and fine gravel, 165 feet long, 24 inches wide, 5 feet deep, 3 hours
August 23, filled land, very rocky, 384 feet long, 24 inches wide, 5 feet deep, 6½ hours
August 24, coarse gravel and sand, 438 feet long, 24 inches wide, 5 feet deep, 8 hours
August 25, very rocky and wet, 445 feet long, 24 inches wide, 5 feet deep, 8½ hours
August 26, fine gravel and hard-pan, 295 feet long, 24 inches wide, 5 feet deep, 5½ hours
August 27, gravel, clay and hard pan, 472 feet long, 24 inches wide, 5 feet deep, 8 hours
August 28, filled land, rocky, 180 feet long, 24 inches wide, 5 feet deep, 3½ hours

This total excavation amounts to 34,190 cubic yards. The costs of this work are:

Operator	$88.00
Fireman	66.00
Freight	38.00
Coal	48.00
Oil, etc.	20.00
Repairs and depreciation	20.00
Extra labor	50.00
Total	$330.00

	Cents
Cost of excavation per cubic yard	9.65
Cost of excavation per cubic yard, including rental price	17.2
Cost of excavation per cubic yard, hand labor (estimated)	63

In addition to the work done in Worcester, the machine has brought in a revenue of $9,011.28 for rentals, not including the job now going on at Auburn, Mass.

The total cost of replacements and repair parts since the machine was purchased has been $3,864.44. It shows no unusual signs of wear and is apparently good for many years of service.

ACKNOWLEDGMENT.—From a paper read before the New England Water Works Association, Holyoke, Mass., September, 1920.

International Association of Street Cleaning Officials

Forty-four street cleaning officials, representing 28 municipalities of the United States and Canada, formed themselves into the International Association of Street Cleaning Officials at a conference held in Chicago in October under the auspices of the street cleaning department of that city. Its object is the acquisition and dissemination of knowledge relating to the cleaning of streets, with a view to improving the service and reducing the cost. Active membership is limited to superintendents of street cleaning departments in municipalities of the United States and Canada, and other persons connected with street cleaning departments. Associate members are manufacturers of and dealers in appliances relating to the interests kindred to the Association. Honorary membership continues during one session only. Life membership is conferred only upon recommendation of the Board of Governors. Associate and honorary members can neither vote nor hold office. Officers elected for the ensuing year were as follows:

President, W. J. Galligan, Assistant Superintendent of Streets, Chicago; Vice-President, Theodore Eichhorn, Superintendent of Streets, Erie, Pa.; Secretary, A. M. Anderson, Chicago; Treasurer, Robert W. Waddell, City Engineer, Kansas City, Mo.—Board of Governors: Abraham Swan, Jr., Engineer of Streets, Trenton, N. J.; J. W. Motte, Director of Public Works, Savannah, Ga.; F. W. Doane, City Engineer, Halifax, N. S.; W. B. Lowry, Manager of Parks and Improvements, Denver, Colo.; and Peter J. Owen, Superintendent of Streets, San Francisco, Calif.

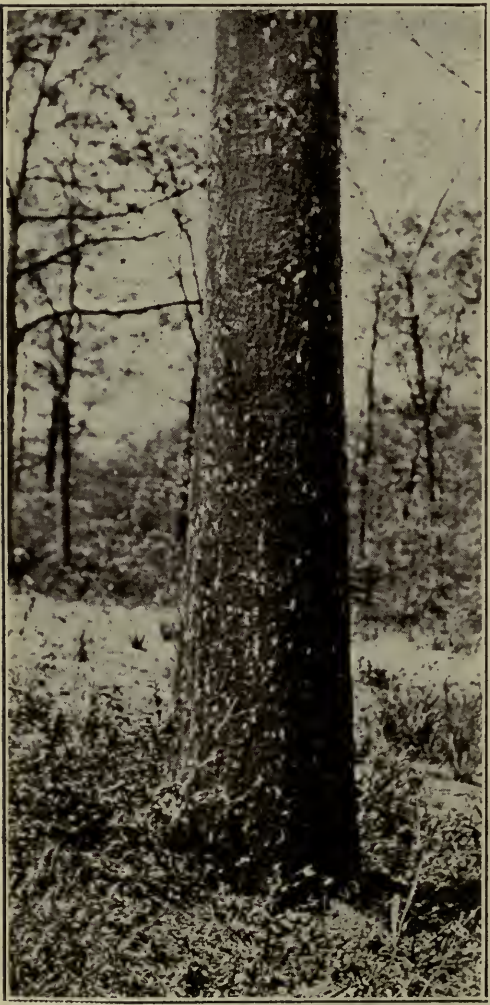
Fighting the Oak Leaf Roller

Damage from This Insect Checked by Constant Care and Spraying

By William W. Colton

Formerly Forest Commissioner, Newton, Mass.

THE damage done by the oak leaf roller, known scientifically as *Archips Argyrospila,* was quite severe for two or three years in Newton. Most of the oak trees were entirely stripped and many died as a result. This insect made its first appearance in West Newton in the spring of 1916. In 1917 it spread to the west, to Auburndale, and in 1918 it appeared on oak trees in all sections of Newton, Brookline, and parts of Boston and Needham. As far as investigators have been able to discover, there has not been an outbreak anywhere else in the northeastern section of the United States. About 1909 there was a serious outbreak on the oak trees in the Middlesex Fells which lasted for about four years and has since disappeared. The insect appears quite unexpectedly in one locality, doing considerable damage for a few years, and then disappears almost completely in that locality, making its appearance again after a period of several years.



A TREE UNDER ATTACK BY THE OAK LEAF ROLLER

The larvae of the oak leaf roller appear as soon as the buds start, and begin eating the unfolding leaves, bending them over and tying them together with a fine web. Inside this protection the larvae live and feed. Where they are abundant, as on oak trees the last few years, every leaf is covered with this fine web to such an extent that no spray mixture used can be forced through the protection thus established and settle on the leaf surface.

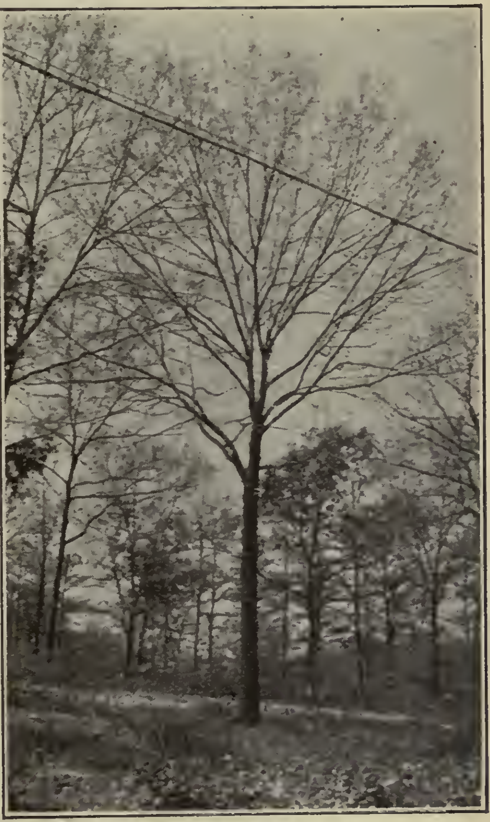
The eggs begin to hatch about the middle of May, the exact time depending on the weather. The larvae feed as stated above for from 18 to 28 days. The average duration of the feeding in Newton was about three weeks, as observed through two seasons. At the end of this period the larva spreads a thin web over itself in the crevices of the bark, a rolled leaf, or between several leaves tied together by its own silk. In this position it changes to the pupa stage, remaining thus for about ten days, when the adult moth appears. The moth is about ¼-inch long when in repose, and ¾ to 1 inch in expanse of wings. It varies in color from a rusty red or brown to a buff or tan color. These little moths fly about, depositing their eggs in little oval patches on the trunks, limbs and twigs of trees, generally on the tree upon which they have been feeding. These egg masses are grey in color, being almost exactly the color of the bark on which they are deposited. The egg mass consists of an average of 100 eggs and is coated with a heavy varnish to protect them from the weather and other enemies. Each female moth lays two or three masses of eggs and averages from 150 to 250 eggs. As soon as the eggs are laid, the moth disappears, and the damage for the season is over. There is only one brood in a season.

The usual methods of controlling leaf-eating insects by spraying with a stomach poison, such as arsenate of lead, do not prove successful with the leaf roller. The fine web spun over the leaves during feeding acts as a perfect protection from the spray. The writer conducted numerous experiments for three years which led to interesting and effective conclusions, here recorded for the benefit of other city foresters who may be called upon to combat this insect.

Results of Experiments

Arsenate of lead has absolutely no effect upon the leaf roller, whether applied early or late. A great number of young larvae can be killed and defoliation prevented by spraying with nicotine or black leaf 40 and soap solution very early in the season soon after the leaves begin to unfold. A spraying mixture of this nature would have to be repeated about three weeks later, using arsenate of lead in order to check the feeding of the gypsy moth. The eggs of the leaf roller are susceptible to killing by the use of miscible oil when the tree is dormant. Experiments conducted elsewhere show that the oil kills from 91 to 99.6 per cent of the egg masses that are touched by it. A miscible oil used in proportions of one gallon of oil to fifteen gallons of water will kill the eggs and not injure the trees.

It would seem from these conclusions that the only way to save valuable oak trees is to have them sprayed with miscible oil early in the spring before the buds open. Spraying of this nature can be done at any time during the winter or spring when the temperature is high enough to prevent freezing. It is preferable, however, to do it during March or April, or as near to the time of the opening of the buds as possible. When there is a bad infestation, this spraying should be followed by a spraying of nicotine and soap shortly after the leaves begin to unfold and before the larvae get large enough to strip the tree. This will kill many of the young larvae and drive all of them to the ground, if applied thoroughly. A band of tanglefoot applied to the trunk of the tree at this time and combed or renewed every other day will prevent the larvae from again ascending the tree. This combing or renewing is very important when tanglefoot is used; if this work is not done, the larvae will spin webs over the tanglefoot and bridge it. This treatment should be followed by the regular spraying with arsenate of lead for gypsy moths. If these directions are followed, the writer believes the foliage can be preserved and the trees saved.



A DENUDED TREE

No definite figures as to the cost of the treatment advocated can be given, but, judging from the cost of miscible oils and nicotine and the amounts of each required, it is apparent the cost would be quite high. Woodlands could not be treated without a large outlay of money, and the treatment recommended above should be used only on particularly valuable trees. In the treatment of large numbers of oaks such as surround certain properties in Newton, the writer would advise only the early spraying with nicotine and soap, the use of tanglefoot, and a later spraying with lead, omitting the oil spray.

The methods described above were thoroughly tried out in Newton during the spring and summer of 1919 and were so successful that in practically every place where they were applied the foliage was saved and the infestation was so reduced that it practically disappeared in 1920.

Other valuable information regarding methods of attacking the oak tree, or fruit tree leaf roller, as it is called in some communities, are contained in two bulletins: one is Bulletin 116, part 5, published by the Bureau of Entomology, U. S. Department of Agriculture, entitled "The Fruit Tree Leaf Roller"; the other bulletin, entitled "Fruit Tree Leaf Roller in Colorado," may be secured from the office of the State Entomologist, Fort Collins, Colo.

How to Secure a Red Cross Health Center in Your Community

FACTS and figures revealed by the war, followed by the influenza epidemic, aroused Americans to the earnest consideration of public health. Many requests have come from communities, factories, schools and institutions for visiting and public health nurses, and the National Organization for Public Health Nursing received in one month recently calls for 500 more nurses than it could supply. Requests for literature, for suggestions and for advice have been received to such great extent by the American Red Cross that the society has developed the project of the community health center.

THE
PUBLIC HEALTH NURSE
She Answers Humanity's Call
Your Red Cross Membership makes her work possible

HELPING THE RED CROSS IS HELPING YOUR CITY

The object of the community health center is to prevent disease. Acting on the principle that a "stitch in time saves nine," it has been suggested that illness and epidemics be combated by advertising the value of health and by keeping the public well. So, while health advice is dispensed at the health center, the main project is the promulgation of right living.

How to begin the organization of a community health center is the next question. What about financial backing and obtaining neighborhood interest in the proposed undertaking?

It has been suggested that the machinery of the local county chapter of the Red Cross be used as the basis for the plan. A drive for subscriptions may be featured and local health agencies, clubs, churches and other organizations asked to stand by the scheme. Perhaps the financial situation of the local Red Cross chapter is such that an appropriation may be set aside for the organization of a health center, but in case financial backing is lacking, the health community may be started by a health service carried on at the local Red Cross headquarters.

Arranging the Health Center

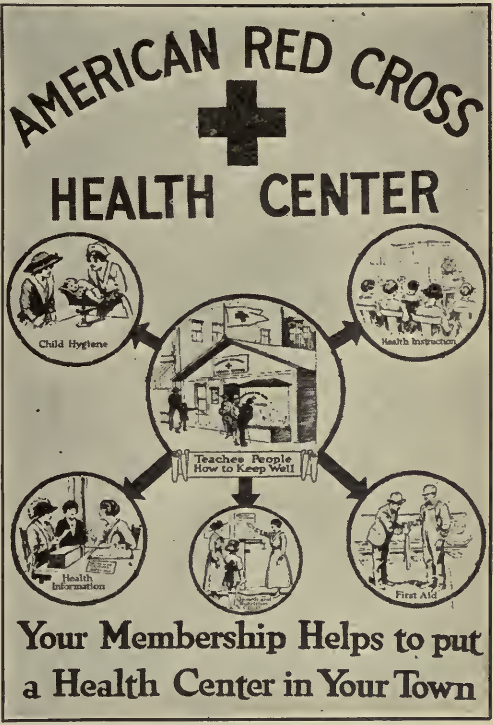
If possible, a down-town storeroom should be rented and the windows used for health displays which will cause shoppers to "stop, look and listen." One suggested window exhibit warns of the dangerous germs which lurk around the milk pail—the link between the consumer and the cow! Another suggests the riddance of the malarial mosquito. One community, adopting this exhibit, placed an aquarium of live wiggle-tails in the window to lend animation to the scene.

Attracted by the outer aspects of the health center, the visitor steps inside. An information desk is the first thing she notices, and there, she learns, information may be obtained on all subjects relating to the promotion of health, from the proper authorities with which to communicate for the removal of the body of a dead cat, to the location of the nearest free clinic. Lists of physicians and nurses available to the community are kept at the information desk, and either a volunteer or a paid worker receiving a small remuneration is placed in charge.

Temporary and permanent exhibits mark the interior of the health center. More than a hundred suggestions for these exhibits have been prepared and will be mailed to anyone upon communication with the National Headquarters of the American Red Cross, at Washington. These suggestions cover infant welfare, school hygiene, milk, foods, control of disease, tuberculosis, safety first and first aid, sanitation, insects and disease, and many others. Interesting wall panels and charts on these subjects are prepared, and in presenting health measures in a sane and pleasing manner emphasis is placed upon the "do" rather than the "don't."

Posters may be obtained either through communication with National or Divisional Red Cross Headquarters. A means of promoting public interest is to conduct a poster contest in which local artists may display their talent by picturing health-promoting suggestions.

The Red Cross acts as a clearing-house for the specially prepared pamphlets of more than a hundred other health agencies. This literature is given away to visitors.



A PUBLIC HEALTH CENTER IS A NECESSITY IN EVERY COMMUNITY, LARGE OR SMALL

With advertising, continued emphasis on the modes of right living, and National Red Cross Headquarters supplying the fundamentals—thus may the community health center be organized at small cost. The only expense incurred is the renting of the down-town storeroom, installation of a few chairs, tables and a telephone, and, if volunteers cannot be obtained, the salary of a paid worker. If money for such expenditures cannot be found by the local Red Cross chapter, then the health service may be originated as a branch of the activities promoted by the local Red Cross headquarters.

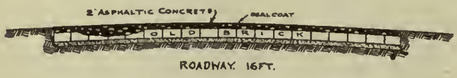
An appropriate time to suggest the adoption of a health center by your community is November 11-25, when the American Red Cross holds its Fourth Membership Roll Call. Put the matter up to the health agencies of the city or county, to the churches, clubs and organizations. And then put it up to the people.

Resurfacing Worn Brick Pavements

By A. R. Young

Engineer, Asphalt Sales Department, The Texas Company

ONE of the problems which are continually confronting municipal officials is the proper method of repairing brick pavements which have become rutted and cobbled. It is expensive to remove the old brick surface and relay a new brick wearing surface, and the work requires the closing of the street for a considerable length of time, to the inconvenience of traffic; hence, many of the cities confronted with the problem of replacing the wearing surface have adopted the policy of surfacing the worn brick with either an asphaltic concrete or a sheet asphalt mixture.



THE METHOD OF RESURFACING

The cost of an asphaltic surface is usually from 55 per cent to 65 per cent of the cost of a new brick surface. The work of laying the asphaltic surface can be done rapidly, and on important traffic thoroughfares it is done without excluding traffic from the street, by laying the surface on one side of the street, confining the traffic to the other side, then turning the traffic on the surfaced portion and completing the remainder of the surface.

The method employed in doing the work is as follows:

1. Remove all crumpled and broken brick and clean out the holes.
2. Thoroughly clean the old brick surface by either sweeping or flushing, or by both sweeping and flushing.
3. Fill all holes and depressions of the old brick surface with asphaltic concrete binder.
4. Lay a close binder of asphaltic concrete so as to bring the street to an even contour and thereby allow a uniform wearing surface to be laid.
5. Lay a wearing course of either asphaltic concrete or sheet asphalt. This course is usually two inches in thickness.

The three outstanding and all-important features of surfacing worn-out brick pavements with asphalt are these:

1. It costs from 35 to 45 per cent less than a new brick surface.
2. It is done easily and rapidly.
3. It gives a durable, resilient pavement that will withstand the wear of time and traffic.

ASPHALTIC CONCRETE LAID ON OLD BRICK PAVEMENT, TOPEKA, KANS., IN 1917

The Houston Foundation

A Municipal Department of Public Welfare

By H. Wirt Steele

Director, Department of Charity, Benevolence and Public Welfare, Houston, Tex.

WHAT is probably the most remarkable will, from some points of view, that has ever been drawn in this country has recently been filed in the Probate Court of Harris County (Houston), Texas. It is the last will and testament of the late Edward Pinkney Hill, jurist, capitalist and ranch owner, who died in San Antonio in June of this year.

The instrument is remarkable in that it reflects the state of mind of the testator to have been somewhat in advance of that of his fellow citizens, especially in relation to the source of his wealth, and his responsibility to the community:

> "I give, bequeath and return to the people of Houston in their corporate capacity as the city of Houston, and the Houston Foundation as created and organized by and under the ordinance of said city passed March 22, 1915, and for the uses and purposes expressed and defined in said ordinance, all my property, real and personal, that I may own at my death."

Thus wrote the late Judge Hill, expressing his desire to give back to the community that which the community had given to him to hold in trust and to use during his lifetime. It is a clear expression of his concept of the source and ownership of the unearned increment, but to make his meaning clearer and more explicit he adds this paragraph:

> "I am influenced to this disposition of my estate by the reflection that I went to Houston early in 1886 with nothing. When I had made a few dollars above necessity I invested in city lots and continued like investments while I lived there up to 1897, before which time, after a division of my property, there remained to me enough to enable me to retire from business. This good fortune came unearned by me through increased value of real estate, and it seems appropriate that the city of Houston should have such share in that good fortune as I am in a situation to return."

Other men and women have bequeathed their estates or parts of them to the cities of their birth or residence for specific or general purposes and uses, but few, if any, have shown the breadth of vision or the sense of innate justice that characterizes the thinking and planning of Judge Hill.

As early as the first part of 1915, Judge Hill had numerous conferences with public officials and leaders in the legal and social professions in Houston. It was just coming to the public knowledge that another large estate intended by another public benefactor to be used for the creation and maintenance of a great charity hospital in Houston had been grossly mismanaged by a board of trustees named in the will of that testator.

The circumstances surrounding the administration of that estate caused wealthy citizens to pause and inquire whether a better way could not be devised for the execution of wills, and the administration of estates for the public good.

It was Judge Hill himself who suggested to the then Mayor of Houston, Honorable Ben Campbell, that there should be in existence a department of municipal government known as the Department of Public Trusts, properly safeguarded as to function and personnel, the duty of which should be to receive and administer the estates intended for public welfare uses.

Out of the conferences which thereupon ensued grew the draft of an ordinance which was subsequently passed by the Council of the city of Houston, and approved by the Mayor, March 22, 1915. This ordinance created a department of the city of Houston to be known as the Department of Charity, Benevolence and Public Welfare, and provided that this department should be under the control and management of a board of trustees to be known as the Board of Public Trusts of the City of Houston; to consist of seven members, each to be a resident of the city of Houston, of skill and discretion in handling financial and trust matters, of good moral character, interested in welfare work and possessing a knowledge of the civic, educational, physical and moral needs of the inhabitants of the city of Houston. Anyone holding or seeking political office is disqualified from serving on the board.

Women are eligible for service on the board, but their membership shall not exceed three at any one time.

The ordinance further specifies that it is not intended this department or board shall supersede or interfere with any charitable organization or institution in the city of Houston nor pledge the credit of the city in any manner to discharge the wants and needs of its indigent population or those who may be in special need of helpful assistance, but, in the language of the ordinance:

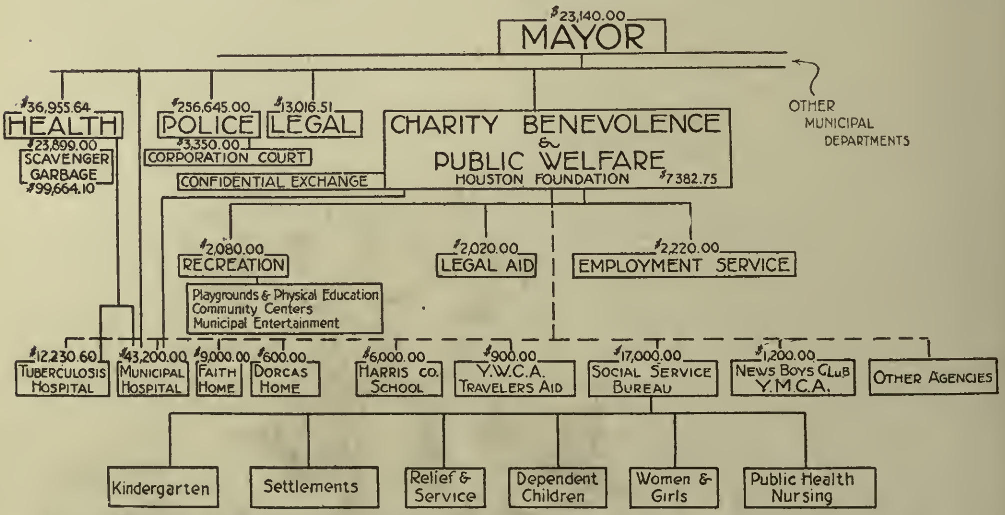
> "It is merely intended to create a board or commission for the purpose of administering such funds as the city may set apart for such purposes, and such funds as may be voluntarily placed in their hands for charitable use by individuals, and which may come to this board from gift, bequest or donation or in any other manner, to be devoted to such purposes, it being expressly provided that the city of Houston shall, as a part of its fixed budget, designate and limit the amount of moneys which it shall expend through such board, and will not be responsible in any one year for obligations of a charitable or social service nature beyond such budget."

Unless otherwise provided, this board shall have control and management of any donations, devises or bequests for public, charitable or benevolent uses to the city of Houston or to this department, and may convert, invest, reinvest and apply the corpus and income from such estate or estates as directed in the instrument or instruments creating such estate or estates, or if there be no specific directions, then in such manner as is provided in the ordinance, which in brief is a manner determined upon by a majority of the board members, by and with the consent of the Council of the city of Houston.

In June, 1916, the ordinance was amended so as to include several specific functions not enumerated in the original law. They are: (1) to investigate, endorse, or refuse to endorse, all charities dependent upon public appeal or general solicitation for support; (2) to encourage the formation of new private charities as need arises; (3) to collect and preserve statistics relating to charities, conditions of life, unemployment and delinquency and to suggest means for improving conditions; (4) to promote intelligent coöperation among all charitable and social agencies in the city, both public and private; (5) to disburse all funds appropriated by the city for charitable or social work; (6) to receive donations or bequests for charitable or social purposes and administer trusts; and (7) to maintain an employment service. The manner in which the department fits into the government machinery of Houston and its relation to other agencies and functions are shown graphically in the accompanying chart.

Immediately after this ordinance was passed, Judge Hill wrote his will in conformity with its provisions.

Although the department has been known since it was organized in 1915 as the Hous-



THIS DIAGRAM SHOWS THE RELATIONS OF THE MANIFOLD WELFARE ACTIVITIES OF HOUSTON, SYSTEMATICALLY COÖRDINATED UNDER THE HOUSTON FOUNDATION ton Foundation, this has really been a misnomer, as there was no "Foundation" until the death of Judge Hill this year, and the first fund constituting the Foundation will not accrue to the department until certain incomes provided have been satisfied and the estate is free from any incumbrance. The amount of the fund which will ultimately remain to be administered by the department is uncertain, as a part of it consists of undeveloped oil lands, the return from which cannot of course be estimated.

Population of First 100 Cities in United States in Order of Their Rank, Showing the Gain from 1910 to 1920

As Given Out by the United States Bureau of the Census

Rank	City	Population in 1920	Increase, 1910-20	
			Number	Per Ct.
1	New York, N. Y.	5,621,151	854,268	17.9
	Manhattan Borough.	2,284,103	—47,439	—2.0
	Bronx "	732,016	301,036	69.8
	Brooklyn "	2,022,262	387,911	23.7
	Queens "	466,811	182,770	64.3
	Richmond "	115,959	29,990	34.9
2	Chicago, Ill.	2,701,705	516,422	23.6
3	Philadelphia, Pa.	1,823,158	274,150	17.7
4	Detroit, Mich.	993,739	527,973	113.4
5	Cleveland, Ohio	796,836	236,173	42.1
6	St. Louis, Mo.	772,897	85,868	12.5
7	Boston, Mass	748,060	77,475	11.6
8	Baltimore, Md.	733,826	175,341	31.4
9	Pittsburgh, Pa.	588,193	54,288	10.2
10	Los Angeles, Calif.	576,673	257,475	80.7
11	San Francisco, Calif.	503,410	91,498	21.9
12	Buffalo, N. Y.	506,775	83,060	19.6
13	Milwaukee, Wis.	457,147	83,290	22.3
14	Washington, D. C.	437,571	106,502	32.2
15	Newark, N. J.	414,216	66,747	19.2
16	Cincinnati, Ohio	401,247	37,656	10.4
17	New Orleans, La.	387,219	48,144	14.2
18	Minneapolis, Minn.	380,582	79,174	26.3
19	Kansas City, Mo.	324,410	76,029	30.6
20	Seattle, Wash.	315,652	78,458	33.1
21	Indianapolis, Ind.	314,194	80,544	34.5
22	Jersey City, N. J.	297,864	30,085	11.2
23	Rochester, N. Y.	295,750	77,601	35.6
24	Portland, Ore.	258,288	51,074	24.6
25	Denver, Colo.	256,369	42,988	20.1
26	Toledo, Ohio	243,109	74,612	44.3
27	Providence, R. I.	237,595	13,269	5.9
28	Columbus, Ohio	237,031	55,520	30.6
29	Louisville, Ky.	234,891	10,963	4.9
30	St. Paul, Minn.	234,595	19,851	9.2
31	Oakland, Calif.	216,361	66,187	44.1
32	Akron, Ohio	208,435	139,368	201.8
33	Atlanta, Ga.	200,616	45,777	29.6
34	Omaha, Nebr.	191,601	67,505	54.4
35	Worcester, Mass.	179,754	33,768	23.1
36	Birmingham, Ala.	178,270	45,585	34.4
37	Syracuse, N. Y.	171,717	34,468	25.1
38	Richmond, Va.	171,667	44,039	34.5
39	New Haven, Conn.	162,519	28,914	21.6
40	Memphis, Tenn.	162,351	31,246	23.8
41	San Antonio, Tex.	161,379	64,765	67.0
42	Dallas, Tex.	158,976	66,872	72.6
43	Dayton, Ohio	152,559	35,982	30.9
44	Bridgeport, Conn.	143,538	41,484	40.6
45	Houston, Tex.	138,076	59,276	75.2
46	Hartford, Conn.	138,036	39,121	39.6
47	Scranton, Pa.	137,783	7,916	6.1
48	Grand Rapids, Mich.	137,634	25,063	22.3
49	Paterson, N. J.	135,866	10,266	8.2
50	Youngstown, Ohio	132,358	53,292	67.4
51	Springfield, Mass.	129,563	40,637	45.7
52	Des Moines, Iowa	126,468	40,100	46.4
53	New Bedford, Mass.	121,217	24,565	25.4
54	Fall River, Mass.	120,485	1,190	1.0
55	Trenton, N. J.	119,289	22,474	23.2
56	Nashville, Tenn.	118,342	7,978	7.2
57	Salt Lake City, Utah.	118,110	25,333	27.3
58	Camden, N. J.	116,309	21,771	23.0
59	Norfolk, Va.	115,777	48,325	71.6
60	Albany, N. Y.	113,344	13,091	13.1
61	Lowell, Mass.	112,759	6,465	6.1
62	Wilmington, Del.	110,168	22,757	26.0
63	Cambridge, Mass.	109,694	4,855	4.6
64	Reading, Pa.	107,784	11,713	12.2
65	Fort Worth, Tex.	106,482	33,170	45.2
66	Spokane, Wash.	104,437	35	*
67	Kansas City, Kans.	101,177	18,846	22.9
68	Yonkers, N. Y.	100,226	20,423	25.6
69	Lynn, Mass.	99,148	9,812	11.0
70	Duluth, Minn.	98,917	20,451	26.1
71	Tacoma, Wash.	96,965	13,222	15.8
72	Elizabeth, N. J.	95,682	22,273	30.3
73	Lawrence, Mass.	94,270	8,378	9.8
74	Utica, N. Y.	94,156	19,737	26.5
75	Erie, Pa.	93,372	26,847	40.4
76	Somerville, Mass.	93,091	15,855	20.5
77	Flint, Mich.	91,599	53,049	137.6
78	Jacksonville, Fla.	91,558	33,859	58.7
79	Waterbury, Conn.	91,410	18,269	25.0
80	Oklahoma City, Okla.	91,258	27,053	42.1
81	Schenectady, N. Y.	88,723	15,897	21.8
82	Canton, Ohio	87,091	36,874	73.4
83	Fort Wayne, Ind.	86,549	22,616	35.4
84	Evansville, Ind.	85,264	15,617	22.4
85	Savannah, Ga.	83,252	18,188	28.0
86	Manchester, N. H.	78,384	8,321	11.9
87	St. Joseph, Mo.	77,939	536	0.7
88	Knoxville, Tenn.	77,818	41,472	114.1
89	El Paso, Tex.	77,543	38,264	97.4
90	Bayonne, N. J.	76,754	21,209	38.2
91	Peoria, Ill.	76,121	9,171	13.7
92	Harrisburg, Pa.	75,917	11,731	18.3
93	San Diego, Calif.	74,683	35,105	88.7
94	Wilkes-Barre, Pa.	73,833	6,728	10.0
95	Allentown, Pa.	73,502	21,589	41.6
96	Wichita, Kans.	72,128	19,678	37.5
97	Tulsa, Okla.	72,075	53,893	296.4
98	Troy, N. Y.	72,013	†4,800	†6.2
99	Sioux City, Iowa	71,227	23,399	48.9
100	South Bend, Ind.	70,983	17,299	32.2

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* Less than one-tenth of 1 per cent.

† Decrease.

Bus Service To and From Centralized Schools

By S. E. Downs

Superintendent, Lower Merion School District, Ardmore, Pa.

FOR the past six years the School District of Lower Merion has transported many children to and from school by busses. All the rural schools have been discontinued, and the work has been centralized so that the smallest building unit is now a school of five rooms.

In addition to the carrying of elementary school children to central buildings, we transport from all districts to a union high school and take boys and girls from the sixth, seventh and eighth grades to convenient centers for manual training and domestic science. By Autocar and Studebaker busses we make all necessary trips with athletic teams, deliver books and supplies, and in many other ways secure for the children of our district the comforts and conveniences of those located in compact sections.

During the past school year these busses have traveled 50,000 miles, and in the six years their total distance has approximated 250,000 miles. In all this work there has been but one accident, and that of a minor nature to a boy who tried to climb upon a bus while it was running.

We could not if we would, and we would not if we could, return to the old types of schools and methods of transportation.

MOTOR BUS USED TO TRANSPORT THE CHILDREN OF THE LOWER MERION, PA., SCHOOL DISTRICT

MORE INTEREST IN HOT LUNCHES

The demonstration agents sent out by the United States Department of Agriculture and the state colleges are helping to establish hot school lunches in communities which are awake to their value. Last year these extension workers, who are trained in home economics, helped establish hot lunches in 2,929 schools. The work is being continued this year on an even larger scale. In some counties a wall of prejudice against the innovation has to be broken down before it can be started. Where this is true, the success of the hot lunch in one school where it has been established is usually followed by a demand for something similar in all the adjacent schools.

Smoke Abatement Activities in Chicago

Work Under the Department of Health Has Greatly Improved Air Conditions

By John Dill Robertson, M.D.

Commissioner of Health, Chicago, Ill.

IN September, 1919, the Mayor of Chicago, by executive order, authorized the Commissioner of Health to direct the work of the Department of Smoke Inspection, and a few months later the City Council passed an ordinance consolidating the Smoke Inspection Department with the Department of Health.

A vigorous campaign for smoke elimination was instituted in September, 1919, and a smoke abatement week was promulgated at the start, securing the coöperation of all fuel users, including railroad interests, power and heating plant owners, municipal plant operators, marine interests, the Janitors' Association, and civic organizations.

A force of nine engineers was employed in the Smoke Department, and this number was greatly augmented by a large force of sanitary inspectors, so that during the last three months of 1919 the total number of stack observations was 6,483 against 486 during the same period of the previous year. During January, 1919, there were 449 observations made by engineers of the Smoke Department, resulting in the detection of 374 violations, and 174 suits instituted. During January, 1920, there were 1,528 observations, 905 violations and 123 suits instituted. In January, 1919, the percentage of violations in observations reported was 85, and this figure was reduced to 58 per cent during the month of January, 1920.

THE GUILTY AND THE GUILTLESS

The following is a summary of the activities of the department in smoke abatement work, from September 1, 1919, to July 1, 1920:

1919	Violations					Percentage
Months	Railroad	Marine	Stationary	Total Violations	Total Observations	of Violations in Observations
January	7	1	368	376	437	86
February	3	0	169	172	216	79
March	8	0	106	114	208	55
April	7	0	215	222	260	85
May	42	4	134	180	320	56
June	137	36	203	376	698	54
July	129	13	150	292	536	54
August	84	30	144	258	459	56
September	202	22	410	634	1,060	60
October	72	11	1,046	1,129	2,036	55
November	54	3	1,159	1,216	2,120	57
December	33	0	958	985	1,835	53
1920						
January	27	0	858	885	1,528	57
February	21	1	746	768	1,724	44
March	54	15	1,013	1,082	2,595	41
April	61	2	965	1,028	2,258	45
May	85	6	697	788	1,747	45
June	88	9	638	735	1,637	44

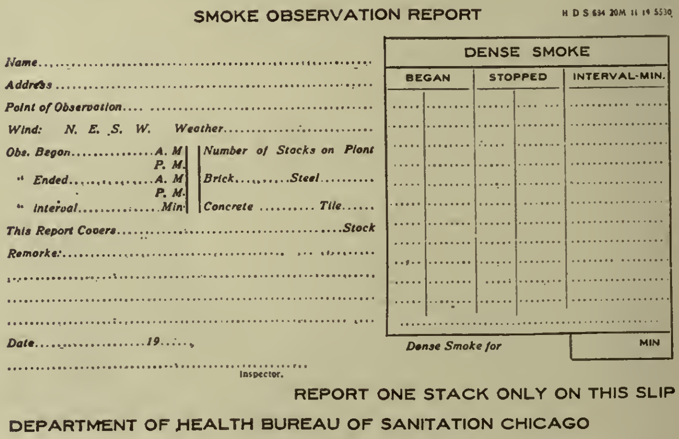
The percentage of violations in total observations from January 1 to July 1, 1919, equals............ 67%
The percentage of violations in total observations from January 1 to July 1, 1920, equals............ 46%
A reduction in 1920 of.. 23%

Other activities of the department in smoke abatement work during the period from September 1, 1919, to July 1, 1920, are shown in the following summary:

1919 Months	Abatem'ts	Summary Abatem'ts	New Furnaces	Reconstructed Furnaces	Stacks	Inspected Furnaces	Violators Sued	Fines
September	426	0	43	15	76	116	38	......
October	907	1	49	7	84	132	64	......
November	904	4	48	6	72	108	182	$17.75
December	850	8	62	12	84	148	247	416.50
1920								
January	643	2	92	9	65	112	123	672.50
February	956	35	80	10	60	116	137	17.75
March	1,513	60	42	22	37	144	312	702.00
April	1,230	1	61	85	114	313	303	179.25
May	959	0	45	72	85	268	198	1,145.75
June	902	1	56	245	117	238	114	441.25

The foreword of the annual report for the year 1919, by the Department of Health, stated:

"An unrelenting campaign is being waged for fresh air. More and more sleeping porches have been constructed, more and more windows are being opened for the admission of outdoor air, but the great battle ahead is to eliminate the smoke nuisance. One should view that individual who poisons his ocean of air through the same glasses through which one looks upon him who ruthlessly contaminates his lake of drinking water. When the people of this community are awakened to the fact that life is shortened, both directly and indirectly, by the large deposits of carbon that are constantly being inhaled and implanted in the tissues of the lungs, they will restrain all who are responsible for such conditions."


SMOKE OBSERVATION REPORT H D S 634 20M 11 19 5530

Name...
Address..
Point of Observation.......................................
Wind: N. E. S. W. Weather..................................
Obs. Began..............A. M. P. M. | Number of Stacks on Plant
" Ended..............A. M. P. M. | Brick..........Steel..........
" Interval..............Min | Concrete.......... Tile......
This Report Covers..............................Stock
Remarks:...
Date....................19......
....
Inspector.

DENSE SMOKE
BEGAN | STOPPED | INTERVAL-MIN.
Dense Smoke for ...... MIN

REPORT ONE STACK ONLY ON THIS SLIP

DEPARTMENT OF HEALTH BUREAU OF SANITATION CHICAGO

Under the smoke ordinance, the department not only makes observations of smoke emission from chimneys and prosecutes for violations of the ordinance, but also supervises the installation of all fuel-burning equipment. This feature of the ordinance has resulted in the installation of modern smokeless equipment in new plants and in the elimination of obsolete, inadequate boilers and furnaces in old plants which have been persistent violators in the past. The outlook for the future promises that Chicago will have more pure air during the coming year than it has had for twenty years previously, partly as a result of this department's work on smoke abatement.

The records of the Health Department show that since the taking over of the Smoke Department, the percentage of deaths from pneumonia, in proportion to population, has been less than in any other previous year. This improvement is attributed partially to the purification of the air due to the abatement of the smoke nuisance.

In conclusion, it should be said that the smoke nuisance can be reduced to a minimum by the support of an informed public and the rigid enforcement of the smoke abatement ordinance.

Protect Your Shade Trees From Gas and Electricity

Shade trees may be destroyed by leaky gas-mains, which poison the roots, making it impossible for the tree to secure nourishment from the ground. Gas-killed trees are often thought to have been killed by insects, and weakened trees are often completely killed by borers or by fungi.

Electric wires which touch trees can easily kill the most beautiful shade tree. This may be due partly to the work of the electric current or to the wearing through the growing surface of the tree by the wire, which deprives the tree of its sustenance.

Water-Works Publicity Campaigns

Let the Taxpayer Know About the Plant, and Treat Him as a Valued Customer

By R. E. McDonnell

Burns & McDonnell, Consulting Engineers, Kansas City, Mo.

THE business of selling water, whether from private or municipally owned plants, is, with few exceptions, handled in a manner tending toward bankruptcy and failure rather than toward profits and success. This is due in a large measure to the failure of the water-works officials to consider the public and to conduct the water-works with the idea that the customers must have the water. Our almost universal practice of ignoring the public is a fault for which we are now paying the penalty.

At this time, when operating costs and prices for all water-works materials are mounting higher and higher and increased rates must be secured, water-works officials are forced to conduct a campaign of publicity of water-works facts and information before an unfriendly or hostile public opinion. The facts about water, its purity, the plant and its condition are now given out in a defensive attitude, and the consumers' unfamiliarity with the plant and its needs shows the necessity of a sustained effort to popularize the utility. Such a campaign of publicity is more effective if conducted constantly rather than spasmodically in time of stress. A large proportion of the public clamor against a utility is due to public ignorance of the utility and its relation to the welfare of the citizens.

The people's knowledge and impressions of water-works matters are usually gained at the water collector's window and through the monthly or quarterly bills mailed out. How many water-works officials have ever compared the affability, courtesy, and patience displayed by the clerk selling water with the manner of the clerk selling dry goods? Can you imagine a clerk in a dry goods store approaching a customer coatless and with a pipe in his mouth? Yet at a water collector's window such a thing is not unusual.

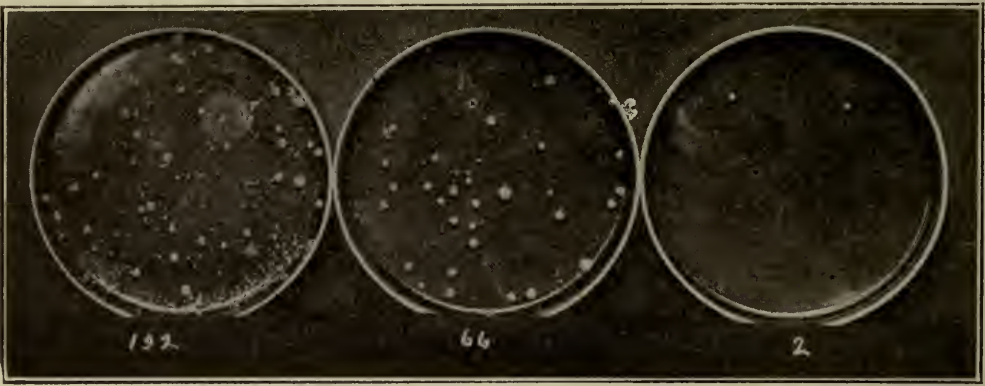
Friends for a municipal water plant are just as important as for a private enterprise, because on the attitude of these friends depends the character of improvements. Appeals to the public for funds must be constantly made; new bond issues or tax levies are required in any growing community, and the readiness with which the public responds to these appeals depends upon the friendly or unfriendly attitude toward the water-works plant and its officials.

Solicit Water Connections

In one particular town where new mains were being laid a fourth of the people along the street were passed by as if with a scornful attitude of mind and the remark, "Come to the office if you want to make my acquaintance." One water-works official in an Indiana city who prided himself on the popularity of his management has discovered that along 100.9 miles of mains there are 2,567 vacant lots, or 48 miles of his extensions front vacant property suitable for residences.

Every vacant lot passed is a direct loss, for it represents a possible customer whose acquaintance and connection are needed. Statistics show that for towns of the same population some water plants have as few as 10 services per 100 people, while others have as many as 27 services per 100 people. Out of a list of 31 cities in the Southwest, it is found that the connections per mile run from 13 to 87, with an average of 50.

In the growth of water-works, activity runs chiefly to extensions without an adequate plant to supply their wants, so that in a few years the vital parts, such as pumps, reservoirs, etc., are not in proportion to the extensions. Then comes a breaking down of the system, and a rehabilitation is necessary, which is doubly hard because the public must be told how and why it happened. This difficulty could often be avoided by constantly watching the growth of the plant and acquainting the public with its needs. This can best be accomplished by giving a complete program of future growth, showing what the plant will need in order to supply the increasing population.



AN EXAMPLE OF THE VALUE OF FILTRATION OF WATER
Plates showing number of bacteria per cubic centimeter in raw, settled and filtered water

Let this program of growth go before the public in every possible way so there will be no shocks or surprises. The rate of consumption from year to year, the rate of extensions of mains, the pump capacity requirements,—in fact, every feature of the plant,—can be presented graphically in diagrams and curves. These should be supplied as news items on folders accompanybills, as cartoons, and on receipted cards. For example, Omaha never lets the public forget the saving resulting from the municipal ownership and operation of that plant, for the rate charged under private ownership is still printed on the cards, and in red ink is printed the reduction in cost of water under municipal ownership.

The Value of Pure Water

The most common lapse of water-works plants is that of permitting impure water to go into the mains. If a city has not pure water it is without the essential qualifications for making the plant a success. After a pure water-supply is established, the fact of its purity should always be kept before the public. The U. S. Public Health Service has fixed a high standard, and when a water plant meets its requirements and sells water for train service this fact should be made known. Photographs of bacteria plates illustrating the difference between the raw water and the purified water, as shown herewith, are always convincing and interesting to the public. Bottled waters are often sold in towns where water of a better quality is furnished by the municipal plant. By a campaign of publicity from a city or company having pure water, bottled water sales can be eliminated.

Meeting the Increased Expenses

The following percentages of increase in the price of water-works materials and labor are derived from figures from more than 100 water-works officials in 36 states:

	Per Cent
Cast iron pipe increase	245
Special castings increase	191
Lead increase	88
Meters (¾-inch)	37
Valves (6-inch)	107
Coal	98
Average increase in superintendents' salaries	37
Average increase in other employes' salaries	57

The alarming result of the investigation is that 79 per cent of the 100 cities are shown to have received no raise of rates, yet practically all of them are in urgent need of an increase. In the 21 per cent securing a raise of rates, the average increase in rates has been 49 per cent.

The one thing that prevents a uniform raise of rates to meet the corresponding increase in the price of other commodities is the public lack of knowledge regarding the needs of the plants, their true condition, and their value in dollars as a basis of rates and as an asset to the community. These facts ought to be clearly set before the public. If comparisons of the costs of all ordinary commodities were made for use of the individual, it would be found that water, although the most essential of all commodities, is the lowest in cost.

Acknowledgment.—From a paper read before the Southwestern Waterworks Association, New Orleans, September, 1920.

New Garbage Reduction Plant in Syracuse Approaches Completion

By S. Gertz

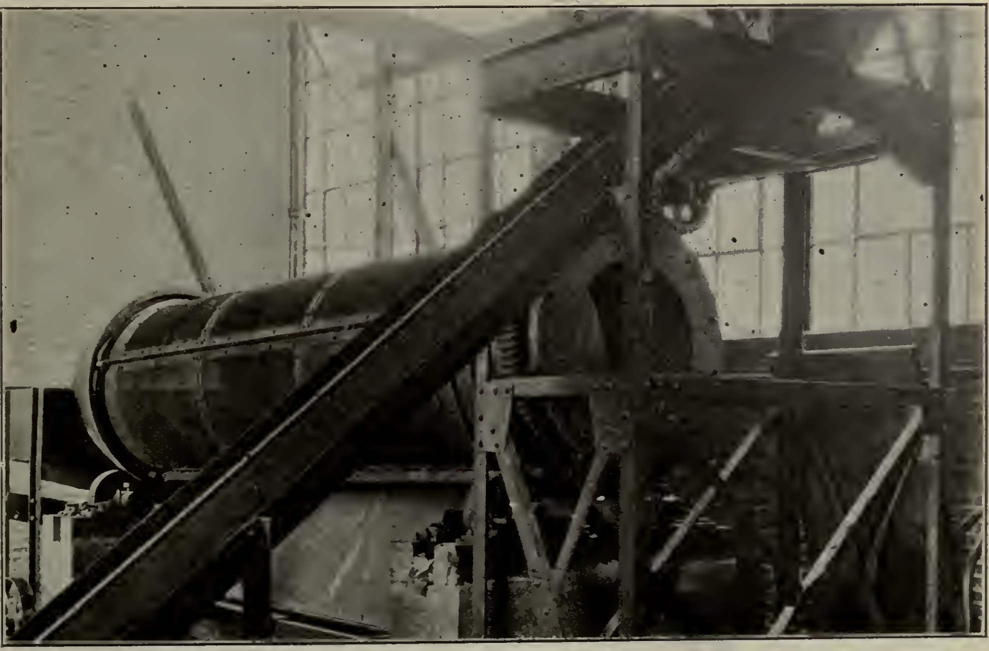
Mechanical Engineer

THERE is an unmistakable trend to-day towards the municipal collection and disposal of city wastes. At times there seems to be some justification in the contention that a private contractor will do the work more efficiently and more economically, but there are other arguments in favor of municipal control which seem to offset this. The strongest argument lies in the thoroughness with which the city itself can do the work. The contractor is interested entirely in making a profit on his contract, while the city is as much interested in doing the work well as in getting it done at the minimum cost. In addition to this, by doing the work the city can control it at all times, and it is able to make improvements and to remedy possible nuisances which a contractor would be unwilling or unable to do.

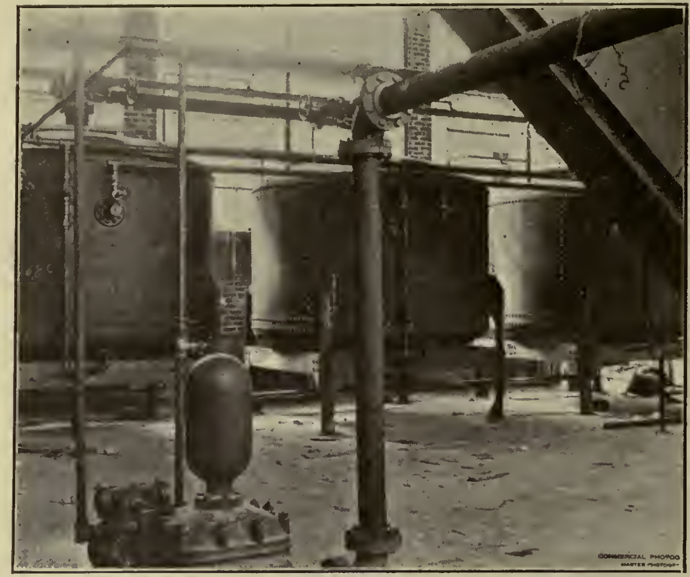
This trend towards municipal control has been reflected recently in garbage reduction plants. Two new municipally owned plants are now being constructed, one in Rochester, N. Y., and the other at Syracuse, N. Y. Both of these plants will employ the Cobwell process, which has been in successful use in Los Angeles since 1915 and which was awarded the gold medal at the Panama-Pacific Exposition.

The Rochester plant will not be completed for about four months, but the plant in Syracuse should be in operation in about six weeks. Both of these plants are located near residential districts. This is unusual and is possible only because improvements led to the development of a process which eliminates odors, so that garbage reduction plants can be located at any convenient place to which trucks may haul the garbage.

Syracuse, according to the recent census, has a population of about 171,000. Using the basis of one-half pound of garbage per day per capita, which seems to hold good for



SCREEN ROOM OF SYRACUSE GARBAGE REDUCTION PLANT



STILL ROOM OF THE NEW SYRACUSE GARBAGE REDUCTION PLANT

eastern cities, the average amount to be taken care of at Syracuse should be about 43 tons per day. Of course, this will vary somewhat in different seasons. From November to March the average amount will probably be about 40 tons per day, while in the months of August and September, when vegetables are in abundance and generally consumed, the quantity may reach 70 tons on some days and will probably approach an average of 60 tons per day.

PRESENT AMOUNT OF GARBAGE COLLECTED PER WEEK, SYRACUSE, N. Y.

During—	Tons
January	235
February	235
March	240
April	250
May	260
June	275
July	300
August	320
September	350
October	275
November	250
December	235

After the plant is in operation it is expected that private collection will be prohibited and the city will then care for household, hotel and restaurant garbage, together with such dead animals as it may be called upon to dispose of. At this time the writer estimates the following as the quantities of garbage which the reduction plant will be called upon to convert:

ESTIMATED AMOUNT OF GARBAGE TO BE COLLECTED PER WEEK

During—	Tons
January	300
February	300
March	300
April	310
May	330
June	340
July	370
August	400
September	440
October	340
November	310
December	300

Equipment and Operation

The plant at Syracuse consists of twelve units with a total capacity of 60 tons per day. In entering the plant, the trucks which haul the garbage or dead animals pass over a platform scale directly in front of the office, and the weight is noted and recorded. The truck then proceeds into the green garbage room. If it carries dead animals, it dumps its load through a large opening onto the basement floor, where provision is made to skin the large animals and cut them up before they are put through the process. If the truck carries garbage, it dumps its load through one of four other openings into the pit in the basement below. From the basement the material goes onto the green-garbage conveyor, which carries it into the reducer room and places it in one of the twelve reducers.

When about 4 tons have been placed in a reducer, the charging opening is sealed, and the garbage is not again exposed to the atmosphere until the grease has been withdrawn and the solids have been sterilized and converted chemically into a dry fertilizer. The entire process, aside from subsequent screening and crushing, is carried on in this machine. Further, no noxious odors are given off, because there is no breaking up of the substances which give up these odors, and none are created. The only substance removed from the garbage in this system is water, and this is condensed, and it emerges from the equipment as a clear liquid.

It is expected that the amounts of materials recovered at Syracuse will be greater than those recovered by other systems. Not only this, but both the grease and the fertilizer will have greater unit values because the Cobwell process is not conducted at so high a temperature and is less destructive to the valuable constituents of the residue. Aside from these economic advantages, there is a more important advantage in the complete elimination of odors, which is a vital consideration when such plants are located near residential districts.

After the garbage has been converted into a fertilizer and the grease recovered, the bottom door of the reducer is opened and the fertilizer goes into a conveying system which carries the material to a revolving screen, this being the final operation in the preparation of the material for market. The oversize material which the screen rejects is passed over a magnetic separator and then passed into a crusher and crushed, after which it is returned to the screen.

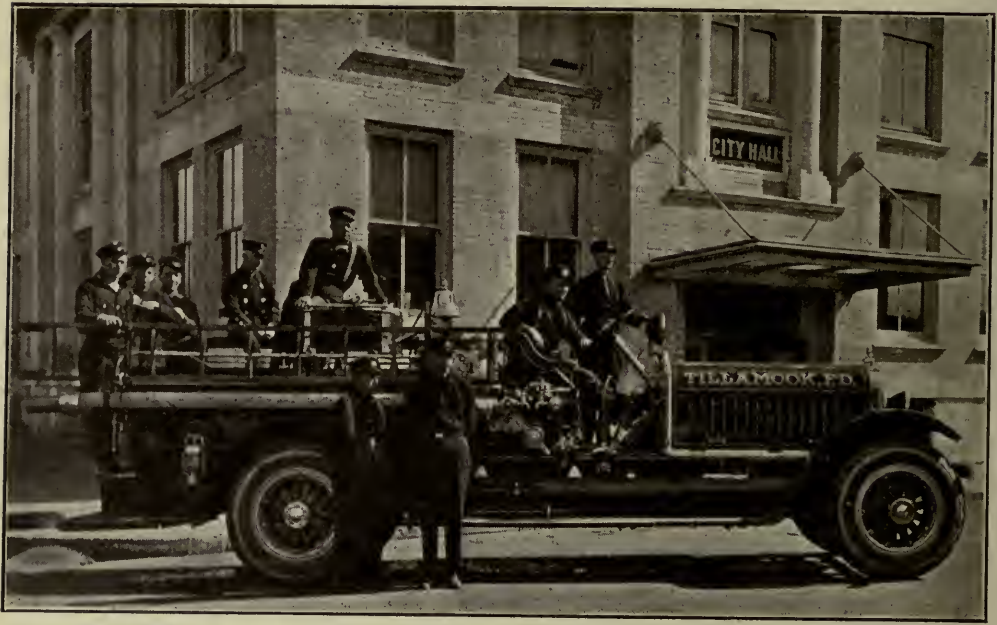
The finished fertilizer is taken from the screen by a conveyor and is discharged into the storage room, where it is accumulated for shipment. The floor of this room is level with the loading platform outside the building, thus making it convenient to load the material into cars. On the shipping platform there are two tanks for the storage of grease, and as the grease is produced in the still room it is pumped to these tanks.

The plant is equipped with a 500-horsepower boiler plant for supplying steam for carrying on the process. There are four boilers of the horizontal return tubular type.

When completed, the plant will operate under a license from the Cobwell Corporation (of Cleveland). The equipment for the plant was designed and fabricated by the C. O. Bartlett & Snow Company, of Cleveland. Gordon Wright, of Syracuse, designed the buildings. The general construction and operation of the plant are under the supervision of Henry C. Allen, City Engineer of Syracuse.

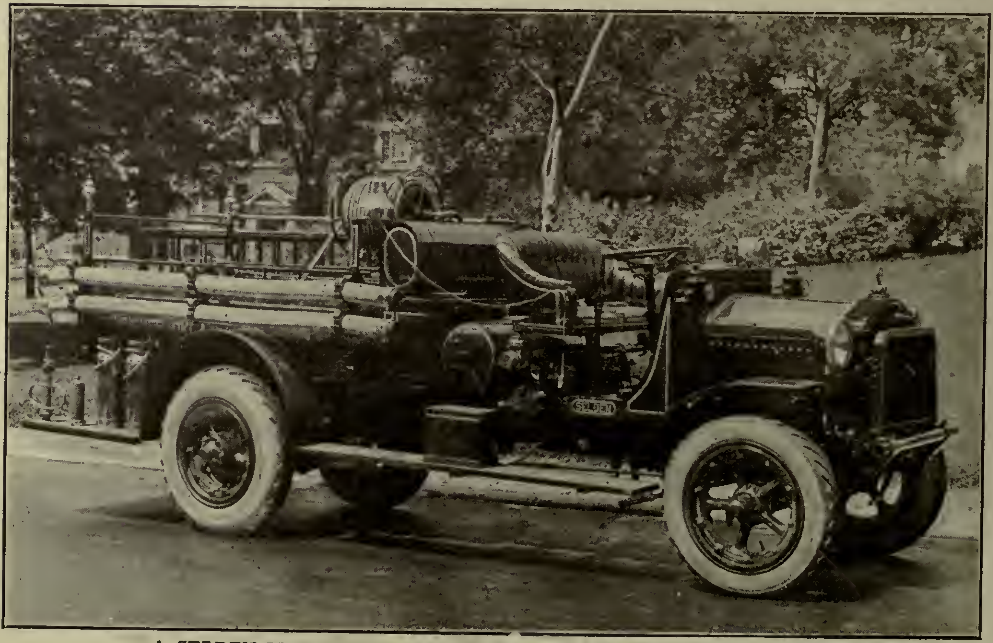
A BRICK PAVEMENT ON A COUNTRY HIGHWAY WITH CONCRETE GUTTER AND CURB

Municipal Motors a Necessity

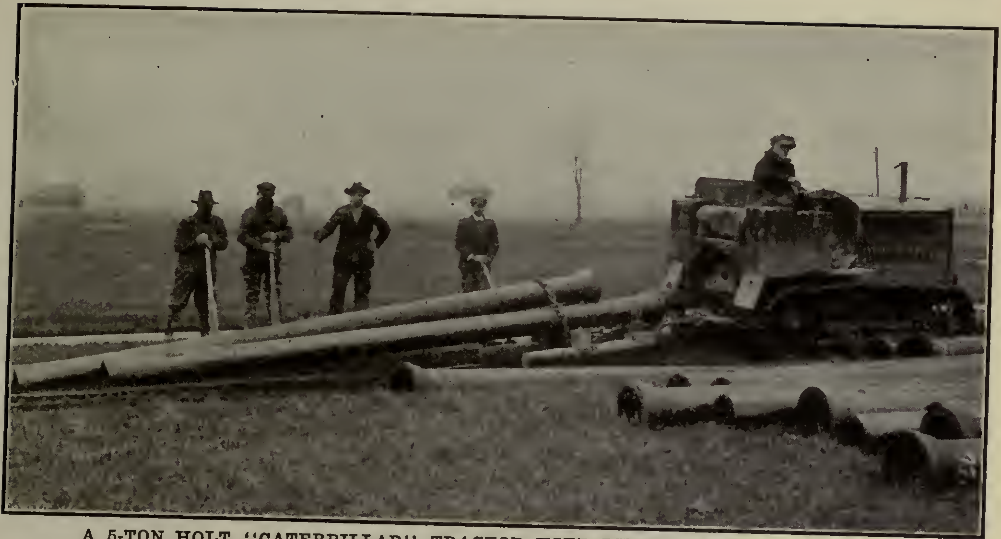


THE FIRST STUTZ ENGINE ON THE PACIFIC COAST, AT TILLAMOOK, ORE.

This 800-gallon triple pump, chemical and hose combination, is shown in front of the City Hall, Tillamook, Ore. The engine passed all the official tests imposed. It is manned by a crew of nine men, of whom two are paid, the remainder being volunteers. Tillamook has a population of 2,000, and possesses a municipal gravity water-supply, the intake being located 5.8 miles from the city at an elevation of 234 feet. This photograph was furnished through the courtesy of Fire Chief Thomas Coates, of Tillamook.

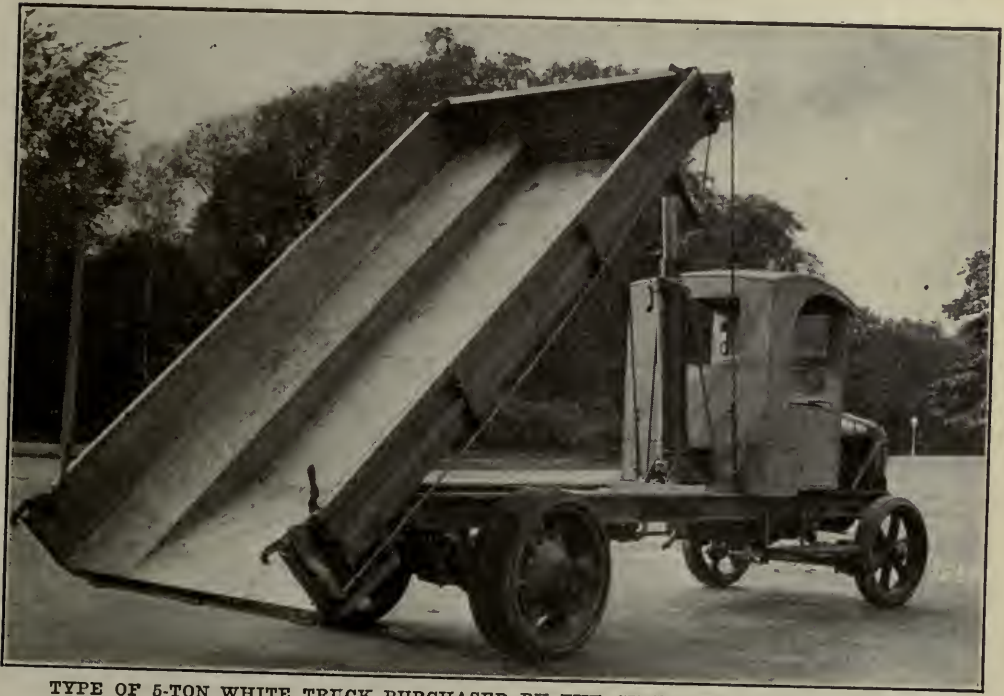


A SELDEN MOTOR FIRE ENGINE IN SERVICE AT PICHER, OKLA.



A 5-TON HOLT "CATERPILLAR" TRACTOR USED BY THE DETROIT BOARD OF WATER COMMISSIONERS

Within the last few years the city of Detroit has taken into the city several towns on the outskirts. None of these tracts previously had any piping systems, and building is going on very rapidly. The city is therefore compelled to lay a great many miles of pipe mains from 8 inches diameter up. The streets in the new sections are unpaved and much of this section is low and wet land, making very bad hauling conditions in the wet seasons. The pipe is hauled by motor truck as far as the truck can travel, which is usually to the head of the street. The pipe is unloaded at the head of the street and is then picked up by the "Caterpillar" and left along the streets to be used as required. It is hauled on a skid, eliminating any lifting by the crew. Two men do this work.



TYPE OF 5-TON WHITE TRUCK PURCHASED BY THE CITY OF NEW YORK FOR THE DEPARTMENT OF STREET CLEANING

When New York was paralyzed by the severe snows of last winter the city resorted to numerous and costly expedients in an effort toward snow removal, with little success. Realizing the seriousness of the situation and the inability of the Street Department, with its limited equipment, to cope with such emergencies, Mayor Hylan named a special commission, comprising the heads of all departments of the city government, to devise means for properly caring for all street-cleaning work. The committee immediately called to its aid a force of competent engineers, who, after making a careful survey of conditions, decided on the installation of sufficient and proper truck equipment.

Municipal Finance

BONDING **ACCOUNTING** **TAXATION**

Getting the Facts About Municipal Liens

By Benjamin Schwartz

Secretary, Yonkers (N. Y.) Bureau of Municipal Research

WITH activity in the real estate market at its peak, increasing demands are made on a municipality for information as to what claims or liens the city may hold against property about to be transferred. Under the present conditions in most cities, the one seeking this information must go to each city department in which a charge may be created against property. As a matter of convenience, however, some municipalities have undertaken, for a low fee, to conduct a search of their books for all liens. On the basis of this search, a certificate is issued with a guarantee protecting the innocent purchaser of property from any liens held by a municipality and not shown on the search. Baltimore, Newark and New York City afford three interesting examples of cities where this service is installed.

Baltimore's Procedure

In Baltimore the service is performed by a separate Bureau of Liens, a subsidiary of the Tax Department, which is under the jurisdiction of the City Collector. The entire time of nine clerks and three typists is required for this service, with the assistance occasionally of two or three others. The liens covered by the search include taxes in arrears, unpaid water rent, charges against the property for opening of streets, paving of footways, paving of alleys, the bed of street on which the property abuts, connecting of sewers, repairs by Water Department, and other obligations which may appear on the books of the various departments. The flat rate of one dollar per search is the charge made for this service. The city of Baltimore has no central ledger of charges in arrears nor any index to such

CITY COLLECTOR'S DEPARTMENT

* * * * * * * * * * *
* CERTIFICATE *
* OF LIENS *
* No. 74935 *
* * * * * * * * * * *

SUB-DEPARTMENT
Bureau of Liens

BALTIMORE, Md., May 20, 1920.

WHEREAS, Application officially numbered as above, now on file in this Bureau, was made for a search of department records for taxes and assessments, constituting liens as described in below-mentioned list, against property known as..4506 W. Baltimore Street.................................. and said application being accompanied by a fee of one dollar, the receipt of which is acknowledged; this is to certify that a search as per said request has been duly made by this Bureau, and unpaid taxes and assessments disclosed which are enumerated below and which constitute liens against said described property. The said amounts mentioned being inclusive of interest and penalty to date of this certificate. See "Special Information" below; it qualifies all matters to which it relates.

Lien in Street Commissioner's Office, for Opening..........	$......
Lien in City Register's Office, for Opening..........	$......
Lien in City Collector's Office, for Opening Baltimore Street Lot No. 98..........	$160.00
Lien for Sewer Connection	$......
Lien for Paving Footway	$ 30.00
Lien for Paving Alley	$......
Lien for Paving Alley	$......
Lien for Nuisance Abatement	$ 1.60
Lien for State and City Taxes and Special Paving for Year 1920..........	$151.20
Lien for State and City Taxes and Special Paving for Year 1919..........	$ 98.70
Lien for State and City Taxes and Special Paving for Year 1918..........	$102.65
Lien for State and City Taxes and Special Paving for Year 19..........	$......
Lien for Water Rent for Year 1920..........	$ 9.50
Lien for Water Rent for Year 1919..........	$ 9.63
Lien for Water Rent for Year 191..........	$......
Lien for Water Rent for Year 191..........	$......
Special Information: Repairing Supply (Water Dept.)..........	$ 16.54

All of which is hereby attested and approved.

....
Chief Clerk.

charges. The searcher must look through the books of the Tax Department, the Water Department, the office of the Highway Engineer and other branches of the city government. It would seem that for the purpose of expediting the search and protecting the city against losses due to omissions, the system of central ledger and index would be necessary. Such books are obviously essential for the proper control of the collecting of arrears in taxes, assessments and water rents. A further necessity arises in the preparation of municipal tax sales.

The essential feature of the application blank which must be filed before the search is begun in any one of the three cities is space for proper description of the property. The certificate issued in Baltimore after the search contains a printed list of sixteen possible liens with blank spaces for the amounts, thus differing from the certificates of Newark and New York City in that the liens as disclosed by the search in the latter cities must be filled in.

It is open to question whether this policy of allotting definite space for certain liens is advisable in cities where trouble is encountered in collecting charges against property. Since accurate description of property is essential, the block-and-lot designation should be used throughout the certificate wherever necessary, instead of the street designation, as contained in the certificate of Baltimore.

The Practice in Newark

In Newark, N. J., the searching and issuing of certificates is divided between two departments. The Comptroller's office and the Water Department conduct separate searches of their books. Both departments issue separate certificates. Four men of the Comptroller's office are especially assigned to this work, namely, one supervisor, one searcher, one draftsman and one copyist.

The liens protected by the certificate cover "taxes, assessments or other municipal liens or charges, if any, that have been levied or assessed against the property described in the application and are liens thereon at the date of the certificate and shall include all unpaid instalments of any assessment theretofore levied and in force, whether due or not." Newark's fees, ranging from $2 to $5 per search, are based principally on the number of square feet of property.

Newark's records for the purpose of the search are centralized. All taxes and assessments (exclusive of water charges, which are contained in a separate ledger in the water department), as soon as they become liens on property, are entered in the Tax and Assessment Ledger, which is arranged according to block and lot. The blocks and lots, however, are not in consecutive order: a page is assigned to each lot as soon as a lien is created against that property. The page of the ledger is immediately entered in a permanent index, which is also arranged according to block and lot.

In New York City

In New York City the work is performed as one of the functions of the Bureau for the Collection of Assessments and Arrears, which is one of the divisions of the Department of Finance. Several searchers are employed in this Bureau, and the Chief Clerk makes assignments of work as requests for searches come in.

Although in Baltimore and Newark any person or corporation may apply for a search and a certificate, the Collector of Assessments and Arrears in New York City can issue a certificate only upon requisition of the "owner, the proposed vendee under a contract of sale, a mortgagee or any person having a vested or contingent interest in any lot or lots, or their duly authorized agent." The certificate covers only arrears of taxes, water rents due prior to the first of March then last past, and assessments which are due and payable. Liens created in the Tenement House, Building, Health and Fire Departments are not included.

New York agrees with Baltimore in principle by charging a uniform fee of $1.60 per search. The records of New York City are more elaborate than those in use in the other two cities. Every year a new loose-leaf index is prepared for each of the sections into which the city is divided. It differs from the Newark index in that it has not the lot numbers already printed; these are inserted as the liens are created. A system of four colored inks is used. If a lot has an unpaid tax, or water charge older than three years, the number of the lot will be entered in the appropriate block, in brown ink. If there is also an unpaid tax or water charge of one, two, or three years' standing, a check is made above the lot number in black ink, red ink, and green ink respectively. For unpaid assessments of any year, the word "assessments" is stamped in the same space. The searcher, translating these colors and the word "assessments," would have to look into three sets of books and one card index for his information.

Extent of Business

An idea of the number of certificates issued, and the revenue from fees therefor, may be obtained from the following table:

	Number of Certificates Issued 1919	Revenue from Fees	Expenses	Surplus
Baltimore ...	30,108	$30,108	$16,000	$14,108
Newark	5,050*	15,140	8,000	7,140

* Approximate.

Newark's small number of guaranteed certificates is explained by the fact that the city issues an official search certificate without guarantee for the flat rate of $1. These, however, are not included in the table.

In the city of New York the situation is peculiar. Guaranteed tax search certificates were issued as far back as 1853, but records are available only since 1898. From 1898 to 1918 only $3,462 was collected from this source, making an average of about one hundred certificates issued each year. This apparent lack of appreciation on the part of the property holder may be explained in two ways:

1. The title companies in New York City, with all their ramifications and connections, have a powerful grip on the service of title searches. The search for municipal liens is furthermore included in their complete title search, which is an added convenience to the purchaser of property.
2. A taxpayer may request and secure free of charge a bill for all taxes, assessments and water rents in arrears, covering the same items as the guaranteed tax search certificates, thus saving the fee of $1.60 charged for the latter.

Since New York City does not have any employes especially employed for the issuing of guaranteed tax search certificates, it is difficult to estimate the cost of the service and the profit, if any, to the city from this source.

No records are kept in any of the cities of losses due to errors of omission in the certificates. It seems that in most cases such omitted items would have to be marked cancelled, and no attempt is made to separate all the cancelled items on the city's books according to the causes of cancellation. Nevertheless, Newark and Baltimore report that the "oversights have been relatively small and total amounts comparatively small." The Comptroller of New York City finds that since 1898 only two cases, involving a total of $425, were remembered as losses.

Conclusions

Necessity of the Service.—The issuing of guaranteed lien search certificates is a proper government function. Although the constitutionality of guaranteed search certificates has not been before the courts, it would seem that the following opinion of Chief Justice White in the case of American Land Co. v. Zeiss, 219 U. S. 47, page 60, would settle this point:

> "As it is indisputable that the general welfare of society is involved in the security of the titles to real estate and in the public registry of such titles, it is obvious that the power to legislate as to such subjects inheres in the very nature of government."

That it is a convenience to the owner of property cannot be questioned. It eliminates misunderstanding between the parties to a realty transaction. It aids the mortgagee in knowing how the mortgagor is paying his obligations to the city. Furthermore, it aids in breaking the hold of the title companies on the service of searches. The companies' fees for a "guaranteed tax arrears, unpaid water rent, charges against search. In New York City these title company searches do not cover liens of Tenement House, Building, Fire and Health Departments. Additional fees are charged for these department searches, and no guarantee is given with them. Where a municipality does not take over the service at a small fee, it can readily be seen what an expensive and unsatisfactory proposition it is for a property holder to get the few items of information he may need.

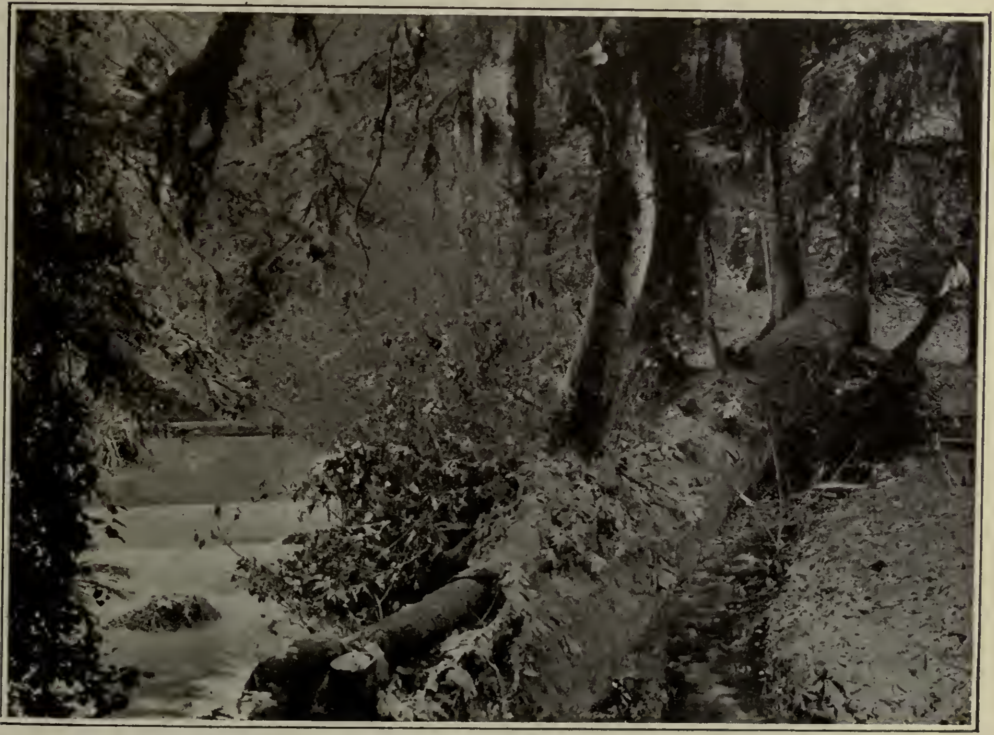
Location of Office Organization.—The searching and issuing of certificates should be performed where the detailed accounts of arrearages are located. If the volume of business warrants a separate bureau, the logical place for it is under the city collector's jurisdiction.

Fees.—The fees charged should be determined on a cost basis. The guaranteed search is a special service for a special class—the realty owners, and as such should be self-sustaining. The cost of the service should be assessed against those requiring it. Since the ledger and index are necessary for the proper functioning of the city and do not have to be especially prepared for this service of guaranteed searches, it would seem that the only items to enter into the cost of the searches should be the salaries of extra clerks needed for this special service, the rental of any space taken up in the pursuit of the work, and any other proper incidental charges.

Business Methods.—To insure against loss through errors of omission or otherwise, it would seem that the following would be necessary in any office issuing guaranteed search certificates:

1. An exact and adequate system of describing property. The installation of the block and lot system is the solution to this problem.
2. A central ledger for all liens of the city against real estate.
3. An index to all arrearages, such as is used in Newark and New York City.
4. A certificate form properly protected. The total amount of liens should at least be stamped with a protectograph to insure against changes to the injury of any innocent purchaser.

Wilderness in a City Park



THERE IS NOTHING "FORMAL" ABOUT WOODLAND PARK, SEATTLE, WASH.

Although Seattle has 33 public parks and 23 playgrounds with a total acreage of 1803 acres, Woodland and Volunteer parks continue to be the favorites both with the people of Seattle and with travelers. Woodland Park is to-day as primeval as when the Siwash Indians gathered there. It is the climax of "informal parking" and its 117 acres on Green Lake are so untouched by the hand of man that it seems unreal when one considers that the metropolis of the Pacific Northwest is just alongside

News and Ideas for Commercial and Civic Organizations

Ramshackle Street Car Line Capitulates

Bluefield, W. Va.—On the streets of Bluefield there was operated for many years a ramshackle old car line that neither appealed to the esthetic sense of the citizens nor offered them service befitting the size or demands of the community. "Do something to improve our car service" was one of the most insistent challenges hurled at the Chamber of Commerce by the irate inhabitants. All the complaints were passed on to the operating company by the Chamber, and the stereotyped answer received was: "We haven't the money to buy new equipment and we cannot sell the line because no one is buying street railways these days." Quite true. So what could the Chamber of Commerce do about it?

It happens that an interurban line is operated from Bluefield to Princeton. Despite all the financial throes which traction companies have been experiencing, this system has maintained good service, has actually reduced its fares, and at the same time makes money. To this company, the Princeton Power Company, the Bluefield Chamber turned for a solution of the street railway enigma, offering it the opportunity of a larger field for operation, and holding out for the city the hope of infinitely better service and equipment.

The Princeton Power Company eagerly seized the opportunity. The owners of the first-mentioned car line were willing to sell at a satisfactory price, but considerable money was needed to help finance the new concern in its efforts to rehabilitate the old line. An obstacle to complete success was the attitude of the general public, which was prejudiced against the line. This unfavorable public sentiment had to be dissipated in order that the company might compete successfully with the rapidly growing but unsatisfactory jitney service and prevent walking from becoming too popular.

The solution of these two problems seemed to lie in throwing the stock of the Princeton Power Company upon the market for popular sale in Bluefield. It was thought the pride in part-ownership would help to revive the public good will, and at the same time supply the funds for the work of rejuvenation. The Princeton Power Company therefore agreed to take over the system, provided the Chamber of Commerce would sell $50,000 worth of 7 per cent preferred stock to show that it meant business.

The Chamber's seriousness was amply demonstrated by the fact that the $50,000 worth of stock was disposed of in forty-eight hours to the business men of this city, and in thirty days the new operating company was in control. Bluefield is bidding farewell, although not fondly, to its rattletraps and spasmodic car service, and another of the Chamber's problems has been solved and is listed among its achievements.

CARROLL R. WOODS,
Secretary-Manager, Bluefield Chamber of Commerce.

Erie Secures Regatta

Erie, Pa.—The Erie Board of Commerce during the last nine months has devoted itself almost entirely to the creation of community pride and community hospitality. For many years the annual regatta of the Interlake Yachting Association has been held at Put-In-Bay, Lake Erie, but this year some of the enterprising representatives of the Erie Yacht Club and the active officers of the Board of Commerce believed it possible to bring the regatta to Erie, the harbor being safe, and, in its landlocked dimensions of five miles in length and two miles in breadth, capable of handling races and events called for in any regatta.

Armed, therefore, with arguments and with a definite plan, representatives of the Yacht Club and the Board of Commerce invited the Yacht Clubs of Lake Erie to visit the city of Erie as its guests and to break away from the time-honored custom of one location only for the regatta. The arguments submitted proved so satisfactory that the Yachting Association's executive committee accepted the city's invitation and held the regatta in the Erie harbor.

This great maritime event took place during the week of July 11-17. The Board of Commerce embraced the opportunity thus offered to secure country-wide publicity for the city and made arrangements to care for the great crowds of people which were brought to Erie for the occasion by excursion trains and boats.

H. A. DAVIDSON,
Secretary, Erie Board of Commerce.

Safeguarding the Public Milk Supply

FALL RIVER, MASS.—A committee of the Fall River Chamber of Commerce discovered that a city's health was measured by the milk it consumed, that invariably where the death rate was high, the amount of milk used was small, and vice versa. Fall River's infant death rate was high. Only 20,000 quarts of milk a day were consumed, and a normal city of 125,000 should consume 80,000 quarts a day.

In 1918 there were seventy-five dealers distributing milk in Fall River. There were seven pasteurizers, only one of which worked, no clarifiers and no fully-equipped dairy plants. Dealers bought milk from producers indiscriminately, bottled it and sold it to their customers. Some milk was whole, clean and safe, some whole but unclean or dangerous, and some was adulterated.

Another committee of the Chamber discovered that producers were compelled to dump over 10,000 quarts of milk on the ground during certain periods because dealers could not sell it as whole milk and had no equipment to make it into preservable by-products.

A third committee of the Chamber reported that the city's infant mortality was largely due to two causes: (1) ignorance of the proper methods of care and feeding, and (2) failure to use milk, i. e., the practice of using a cheaper substitute. A prohibitive price was the usual reason given for not feeding milk to the children.

Still another committee reported that the cost of milk could be reduced by eliminating unnecessary lost motion on collection and delivery routes and providing equipment to absorb the surplus production. This committee went into the producing territory and organized the producers into an association through which the capital stock of the Fall River Milk Producers' Dairy Plant was sold. Six months later Fall River had its first modern dairy plant. A number of the more progressive dealers then combined and put up a second dairy plant, the two establishments being keen competitors. As the result of the Chamber's propaganda, the price of milk was reduced from 17 and 18 cents to 12 and 15 cents, and consumption jumped to nearly 40,000 quarts a day.

With two modern dairy plants established and equipped to produce clarified and pasteurized milk, it was necessary to set up some kind of standard by which the public would know when it was getting good milk.

A conference was held under the auspices of the Municipal Board of Health at which were representatives of the City and State Boards of Health, the producers, distributors, dairymen, the Medical Society, the District Nursing Association, the Association for Community Welfare, the Merchants' Association and the Chamber of Commerce. At this conference a model milk standardizing regulation was presented by the Chamber, and every representative approved of its purpose.

Assured of the united support and encouragement of every local agency concerned in community welfare, the Board of Health promulgated a regulation which paralleled the one proposed at the conference, and Fall River became the first city in Massachusetts to have an effective milk standard.

This regulation provides:

1. That no dealer shall sell milk without a permit from the Board of Health;
2. That all milk shall contain not less than 3.35 per cent butter fat (which assures whole and unadulterated milk);
3. That Grade-A milk must come from dairies scoring not less than 80 per cent (which assures reasonably clean and safe production for unpasteurized milk);
4. That Grade-B milk shall be properly clarified and pasteurized (which makes clean and safe milk certain);
5. That all milk shall be bottled in sterile containers and clearly marked to indicate the grade contained therein, and provides heavy penalties for violation of any part of the regulation. A rigid inspection service is also provided to enforce the regulations.

Thus, by all agencies working together

and coöperating with our municipal officials, Fall River has made sure that its public milk supply shall be whole, clean and safe. Without that work-together spirit it would have been impossible.

Apropos of the movement to reduce infant mortality, the following official figures of the Board of Health are significant:

1917 (prior to campaign)	840
1918 (prior to campaign)	923
1919 (during campaign)	579
1920 (to October 1, 1920)	20

The reduced death rate cannot be traced directly to any particular cause or agency, but it is certain that the coöperative efforts of all the agencies have saved hundreds of lives, the potential value of which cannot be estimated.

The effect of this regulation upon the dairy farms in our own producing area is significant and shows how it has worked to improve the milk supply at the source. The following table shows the inspector's rating of dairies before and after the law was passed:

	1919	1920
Dairies scoring 90 or over	None	2
Dairies scoring between 80 and 90	7	179
Dairies scoring between 70 and 80	103	98
Dairies scoring between 60 and 70	259	138
Dairies scoring under 60	73	15

CHARLES M. KETCHAM,
Manager, Fall River Chamber of Commerce.

Decatur's Housing Program

Decatur, Ill.—Decatur is solving its housing question by a direct and effective method. The house shortage here is perhaps not more acute than it is in the average city throughout the country. Realizing, however, that normal building progress failed to keep pace with the increasing requirements because of the rapid and continued growth in population, the Association of Commerce undertook the task of finding means to remedy the situation.

For several months the Housing Committee appointed by the Association of Commerce experimented with the plan commonly known as the second mortgage plan, whereby assistance was given to individual builders in financing second mortgage loans. Under this plan full responsibility for all details connected with their building was left to the individual builder. This plan failed to stimulate building activity sufficiently to produce the desired results, and a more vigorous policy was decided upon.

A guarantee fund of $300,000 was raised, consisting of pledges signed by responsible business men for amounts ranging from $500 to $25,000 each. On the security of these pledges, local banks agreed to loan the funds required to carry on building operations. The Association of Commerce purchased a tract of forty-five acres immediately adjacent to the city, and this tract was artistically platted by the American Park Builders, of Chicago, who had just completed the preparation of a city plan for Decatur. Plans were then made to construct the first unit of fifty houses on this tract, and the supervision of the entire construction program was placed in the hands of local architects. Six different designs of construction were adopted, and these designs were further varied by altering the exteriors so as to give in effect eighteen different types of houses, thereby avoiding monotony in appearance. The houses will be of four and five rooms each, and will be thoroughly modern and attractive. All materials were purchased in wholesale quantities by expert buyers, and the contracts were awarded in a way to assure most economical and efficient work. In this way a saving of at least $1,000 will be effected on each home. The total cost of each home will be approximately $4,500.

ONE OF THE DESIGNS ADOPTED IN THE DECATUR HOUSING PROJECT

An initial payment of 10 per cent of the purchase price will be required from the purchasers, and one per cent monthly thereafter. These payments will cover principal, interest and probably premiums on life and fire insurance policies. The contract of purchase will provide that in event of the death of the purchaser before payments on his contract are completed, a clear title will be given to his heirs. Provision will also be made for suspending payments for one year in case of the sickness or disability of the purchaser.

Numerous inquiries are being received, and it is apparent that the first unit of fifty houses will be entirely sold before they are completed. A most attractive and desirable location near Decatur was selected for the project, and it promises to become one of the best residence sections of the city. The plan has been effective in securing positive and satisfactory results.

ROBERT J. HOLMES,
Secretary, Decatur Association of Commerce.

This Ladies' Auxiliary Does Things

SOUTH RIVER, N. J.—The Chamber of Commerce of South River has a Ladies' Auxiliary which is promoting community betterment in South River in various ways. Early in June the ladies arranged a large dance and card party which, through the sale of admission tickets and refreshments, earned for the Chamber of Commerce in the neighborhood of $200. The proceeds were used to purchase refuse cans and street signs for the borough.

A little later, when it was desired to augment the funds of the public library, the Auxiliary conducted a delightful entertainment in the Star Theater which netted over $300. The proceeds from the sale of advertising space in the program covered the cost of the affair.

The program was made up of vocal and instrumental music, nature dancing performed under the direction of Chester Thompson, of New Brunswick, N. J., and selections by the Star Theater Orchestra, which contributed its services. With the exception of Mr. Thompson, none but home talent was used. The entertainment was so pleasing that the performers were asked to repeat it two or three weeks later at both New Brunswick and Sayreville, N. J.

CARL B. JENKINS,
Secretary, South River Chamber of Commerce.

Municipal Ownership of Water Plant Secured in Adrian

ADRIAN, MICH.—The Adrian Chamber of Commerce has been instrumental in securing for the city the municipal ownership of the water plant. The method of procedure was as follows:

The question of municipal ownership was brought up at one of the meetings of the Board of Directors, which resulted in the sending of a request to the Mayor and the City Commission to meet with the Board on a certain date in order to formulate plans. Soon thereafter the meeting took place, and it was decided to appoint a citizens' committee of 50 to make a thorough study of the subject of municipal ownership in general and the water question in Adrian in particular. The work of this committee was greatly facilitated by valuable information received from the Research Division of the American City Bureau.

This citizens' committee met several times, and, after a thorough study, recommended that a special election be held for the purpose of deciding whether or not the water plant should be purchased. The Chamber of Commerce then got down to work in earnest and conducted a series of educational mass meetings for the voters. Some of these meetings were held in various schoolhouses in Adrian and some in the library auditorium, and were addressed by members of the Board of Directors or by the Secretary of the Chamber of Commerce. The matter of municipal ownership was also discussed at a Members' Forum of the Adrian Chamber.

The day before the election the members of the Board and the Secretary made good use of the telephone in reminding the voters of the election to be held the following day. The special election was held on June 18 and the citizens of Adrian voted four to one to purchase the water plant at a cost of $220,000.

J. N. SLETTEN,
Secretary, Adrian Chamber of Commerce.

Phoenix to Be Replanned

PHOENIX, ARIZ.—Phoenix will soon be in the ranks of planned cities. The City Commission recently adopted a resolution presented by the Chamber of Commerce and endorsed by all civic bodies, asking for the appointment of a City Plan Commission. The result was a visit to Phoenix during July by one of the leading city planners in the country, who made some valuable suggestions.

The Chamber of Commerce realizes that now—or never—is the time to lay out the city along scientific lines. Although Phoenix is still a small city, it has increased 160.9 per cent in population in ten years, according to the late government census, and has undergone a complete change in that time. As a jobbing center it has sprung up, as it were, over night, and the tendency now is toward manufacturing. With these things in mind, the City Plan Commission decided that the first step in the replanning work would be to establish a manufacturing

Snow Removal

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REG. U.S. PAT. OFF

TRACTORS

February 21, 1920.

Fourteen miles of snow drifts completely tied up the Cleveland-Akron paved road four days this week. The most effective snow drift wrecker was a Holt "Caterpillar" Tractor. This was the only vehicle which could push its way thru the six and eight foot drifts.

"The Akron Press"

CLEARING the snow faster than it drifts is the solution of the *snow removal* problem. Experience has shown men, teams and trucks cannot keep the roads open.

The "Caterpillar" snow removal outfit has proven entirely successful in removing snow from the city streets and country highways. Powerful, it moves the deepest drifts; active, it instantly turns within its own length; fast, it is able to *keep the road open during the heavy storms.*

After exhaustive investigation and exacting tests *New York City purchased 50 5-ton "Caterpillar" Tractors* to combat snow and to insure uninterrupted traffic on the metropolitan thorofares.

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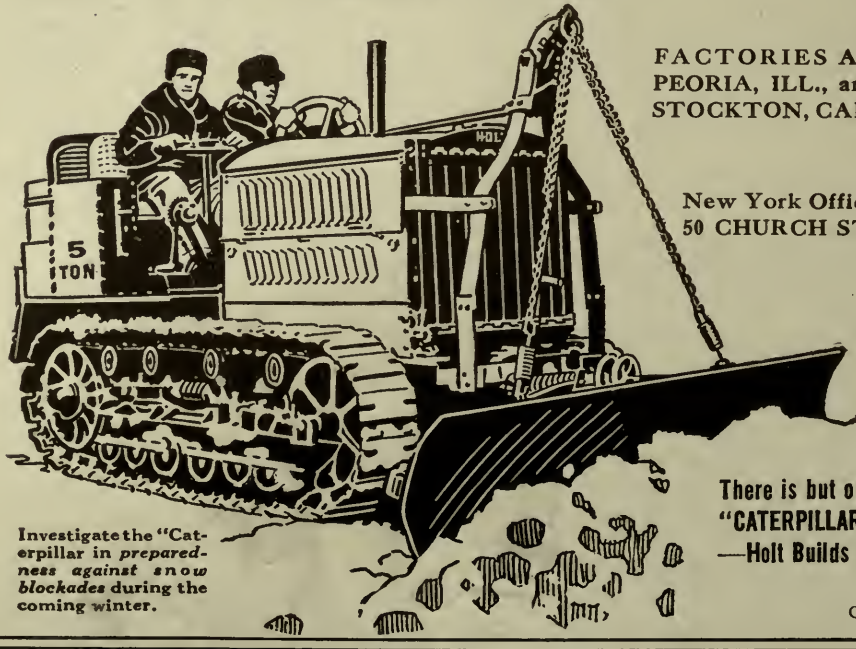

Investigate the "Caterpillar in *preparedness against snow blockades* during the coming winter.

**There is but one
"CATERPILLAR"
—Holt Builds it.**

C-3

district. The city wishes to avoid overcrowding, or bringing together, to the disadvantage of both, the industrial and the residential sections. Already there has been considerable complaint on account of their overlapping, but the Commission is expected to remedy it.

Other things which it is believed that the city plan can provide are a new city hall, a county court house, new schools, adequate parks, an auto camp ground, a landing field for aircraft, playgrounds, and boulevards.

The city planning movement was started several years ago by the Chamber of Commerce, which got behind it as an actual need from a business standpoint. At that time the people were not receptive to the idea, but recent commercial growth, the pushing back of the residential districts, the coming of new industries with an increased demand for office buildings, warehouses and factories, have changed the public viewpoint to one largely in favor of the city plan. The large area of irrigated land now surrounding Phoenix, amounting to about 400,000 acres, and the big increase in crop values on those lands which last year totalled over $40,000,000, have helped to arouse a spirit of progress.

HARRY WELCH,
Secretary, Phœnix Chamber of Commerce.

An Industrial Efficiency Department

DALLAS, TEX.—The Dallas Chamber of Commerce maintains a department of Industrial Efficiency which assists business houses in their efforts to bring about satisfactory production conditions. The activities of this department consist of labor audits, studies of personnel and production problems, and the introduction of training systems for the upgrading of employes.

Under the direction of this department, numerous studies of problems relating to labor turnover, employment and training have been undertaken. Several firms have been able to make material reductions in labor turnover and greatly increase the production volume. One Dallas corporation, through coöperation with this department, has been able to effect a saving of $1,000 per month on the cost of training its employes. The labor turnover has also been decreased, and the efficiency of the individual employes greatly increased.

The Dallas Chamber offers this service because it feels that its responsibility in bringing a new firm to the city includes helping to make the business successful in the greatest possible degree.

Z. E. BLACK,
Director of Publicity, Dallas Chamber of Commerce and Manufacturers' Association.

Milwaukee Conducts Successful "No Accident Week"

By Louis Resnick

Editor *National Safety News*, Chicago, Ill.

TO Milwaukee belongs the honorable distinction of having gone through an entire week—the week of September 26 to October 2, during which the Ninth Annual Safety Congress was held in the city—without a single fatal accident, and this in a city of more than half a million people, with thousands of visitors within her gates and with 46,000 automobiles and motor trucks operating on her streets.

This saving of life was due to the intensive campaign of the Safety and Sanitation Committee of the Milwaukee Association of Commerce, which coöperated to the utmost with the National Safety Council, under whose auspices the Safety Congress was held, in its effort to make "No-Accident Week" a fact and not merely a fable.

One of the most effective features of the campaign was the novel method of recruiting the school children and their parents for the cause of safety. One hundred and twenty-five thousand letters, in the original handwriting of the children, written in the classroom at school, were taken home to the fathers and mothers, together with a pledge card. The child's letter requested its parents to sign the pledge of carefulness and to coöperate in every way to prevent accidents on the street, in the home, and at work. The Superintendent of Schools in Milwaukee estimates that fully 90 per cent

*Champion Snow Plow attached to a White Truck.
Used by the Pennsylvania State Highway Dept.*

"Business as usual" all Winter long

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The simple solution of the snow removal problem is an adequate equipment of Champion Snow Plows.

Traffic tie-ups and suspended business due to excessive snow falls are a thing of the past in the county, state or city that has standardized on Champions. Costly and unsatisfactory hand labor is eliminated.

Champion Snow Plows are easily attached to any standard motor truck and are quickly detachable when truck is to be used for other purposes. Write or wire for Bulletin K. D. T. containing full particulars and many photographs.

General Sales Offices:

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The GOOD ROADS Machinery Co., Inc.

"Everything for the Roadmaker"

of these pledges were returned, signed by the parents. Interest in this drive was stimulated among the children by the offer of "100 per cent certificates," signed by the president of the National Safety Council and the manager of the Milwaukee Safety Council, to every schoolroom which made a 100 per cent record in returning the signed pledges.

"Proto" and "Toto," popular professional clowns, demonstrated in an amusing and instructive manner the five fundamentals of safety to 125,000 school children. Safety plays and safety songs and a definite program of accident prevention were included with the regular studies in the schools for some time prior to No-Accident Week. The 3,000 school teachers of Milwaukee County were given books on "Education in Accident Prevention" in advance of the campaign to guide them in the work of instilling safety principles into the minds of their charges.

Organize Safe Drivers' Club

Each of the 46,000 automobile drivers of Milwaukee received at the outset of the campaign a letter urging the utmost care in driving, and complete coöperation to prevent accidents. That these letters were effective is shown by the record of the week. With the letters were sent applications for membership in the Safe Drivers' Club, sponsored by the Milwaukee Safety Council. Within ten days 12,000 drivers had applied and been admitted to membership, each paying the $1 membership fee.

Window cards to the number of 125,000, preaching safety, were posted in homes and stores. To workmen in the various industries of Milwaukee 100,000 safety flag pins were distributed. The merchants and civic associations contributed their support financially by providing street decorations and window displays which attracted attention at every turn on the main avenues of the city.

More than 720,000 leaflets carrying safety messages on jay-walking, careless driving, blood poisoning and other common hazards were distributed by the department stores and other business houses in bundles and packages of all sorts sent out by them. Every bundle that went into a home during the week carried a safety message. A safety message was carried in every business letter from practically every concern in the city. Safety sermons were preached by the ministers and priests of all creeds in practically every church on the Sunday preceding the opening of the Congress.

The street car company ran a street car covered with safety banners, slogans and decorations, on which a loud siren whistle was in constant blast. This car hauled a gondola trailer on which was a wrecked automobile with the Devil at the wheel, pointing to the certain consequences of carelessness. The whole presented a most spectacular and impressive safety lesson.

Interest in safety was stimulated among the people of the city by the distribution of 100,000 free tickets for admission to the great Safety Exhibit held in connection with the Congress.

Papers Give Prizes for Safety Slogans

The interest of the press was obtained, and each of the large Milwaukee daily newspapers conducted a safety contest of some kind. *The Milwaukee Sentinel* offered prizes for the best safety slogans. *The Milwaukee Journal* held a safety poster contest. *The Wisconsin News* conducted an experience contest on the question, "How near have you come to death?" which brought more than 600 answers. *The Milwaukee Leader* conducted a safety household hint contest. Besides the newspaper contests, there was a safety educational cartoon competition in which 62 professional artists vied with each other to produce in a pen-and-ink sketch the strongest safety sermon.

The jay-walker on the streets was not allowed to get by without a reproach. Through the enlistment of 4,000 vigilant newsboys, circulars on foolhardiness and the dangers of jay-walking were distributed to every man, woman and child observed recklessly dashing across the city thoroughfares. "Cross at Crossing" signs were painted on the sidewalk at all main street intersections by the Boy Scouts of the city.

There was no escaping the safety propaganda for the Milwaukee citizen, even in the moving picture theaters. At the end of every film was tacked a 200-foot safety trailer film which flashed the message of the hour on the screen. Stores, business houses, factories and public places displayed 30,000 large safety bulletins. Fifteen industrial plants published special safety numbers of their house organs.

Boy delegates from each schoolroom of every public and parochial school of Mil-

Snowless Sidewalks

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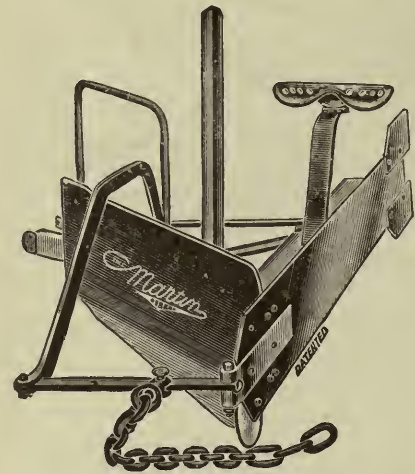

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They are equipped with our especially convenient lifting device. The blades are hinged and allow passage over obstructions without shock. Plows are made with 8 and 10 foot blades.

Hundreds of Baker Plows are in use in the Snow Belt and are giving real service.

We also make 20th Century Horse Drawn Snow Plows for sidewalk work

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503 Stanford Ave., Springfield, Ill.

WAS DADDY HURT MUCH?
NO ACCIDENT WEEK
Keep the kiddies off the street!
Safety First
-impress it upon your mind

THE THREE PRIZE-WINNING POSTERS IN THE CONTEST HELD BY THE MILWAUKEE JOURNAL

waukee and its suburbs, numbering 1,700 representatives in all, attended a mass meeting during the Congress, in which they heard inspirational talks from some of the most eloquent safety orators, after which they were organized into the Safety Cadets, a permanent organization in which they will endeavor to enroll all their schoolmates for the cause of safety. Dr. E. George Payne, Principal of the Harris Teachers' College of St. Louis, and Vice Chairman of the Education Section of the Council, addressed a mass meeting of 1,500 school teachers, and outlined methods of training pupils in safety.

Milwaukee Proves "It Can Be Done"

During the three years in which there has been any public safety work to speak of, one large city after another tried to go through a single week without an accidental death, and while some really remarkable reductions in accidents were brought about, the results always fell just a little short of the goal. St. Louis in 1918 came through its No-Accident Week with one fatality as against ten for the preceding week and twenty-five for the corresponding week of the previous year; Cleveland last year during its No-Accident Week reduced its score on this account from sixteen during the corresponding week of the previous year to six; the Lehigh Valley cities in a noteworthy No-Accident Week campaign in the spring of this year came through with only one fatality. And then Milwaukee proved that it could be done.

Milwaukee has the honor of being the first large city to achieve this record, which proves what organized effort for safety can accomplish, and is evidence of the fact that if a community is sufficiently aroused, the accident slate can be kept clean, not only in one especially designated week, but throughout the year.

The records of Dr. F. N. Franklin, Coroner of Milwaukee County, show an average of seven accidental deaths a week for the month just prior to the Ninth Annual Safety Congress. For the week that the National Safety Council was in town there is a blank page in his book—and that is the page of which he and the citizens of Milwaukee are rightly most proud. As for minor accidents during No-Accident Week, it is estimated by Dr. Harry E. Bradley, Chairman of the Safe Drivers' Club of Milwaukee, and Police Surgeon of the Milwaukee Police Department, that the injury cases at the emergency hospitals of the city decreased 40 per cent during that week.

Coöperation Did It

"Considering the large number of automobiles in use in Milwaukee, this is one of the most remarkable records made by any city in gripping and controlling this new giant hazard," was the comment of C. W. Price, General Manager of the National Safety Council, on Milwaukee's No-Accident Week. "It is the most remarkable example of the coöperation of all industries, schools, civic organizations and churches in arousing the entire community to a pitch of interest which made it possible to eliminate deaths from accidents during a whole week."

New York City Buys a Friedman "Snow-Loader"

After thoro tests under the most exacting conditions in removing huge piles of snow and ice last winter New York City has purchased a Friedman "Snow Loader".

Last winter the Friedman machine loaded trucks of 8 cubic yards capacity at an average speed of 60 to 90 seconds. Its use cuts the cost of snow removal about 90 per cent. Write for information.

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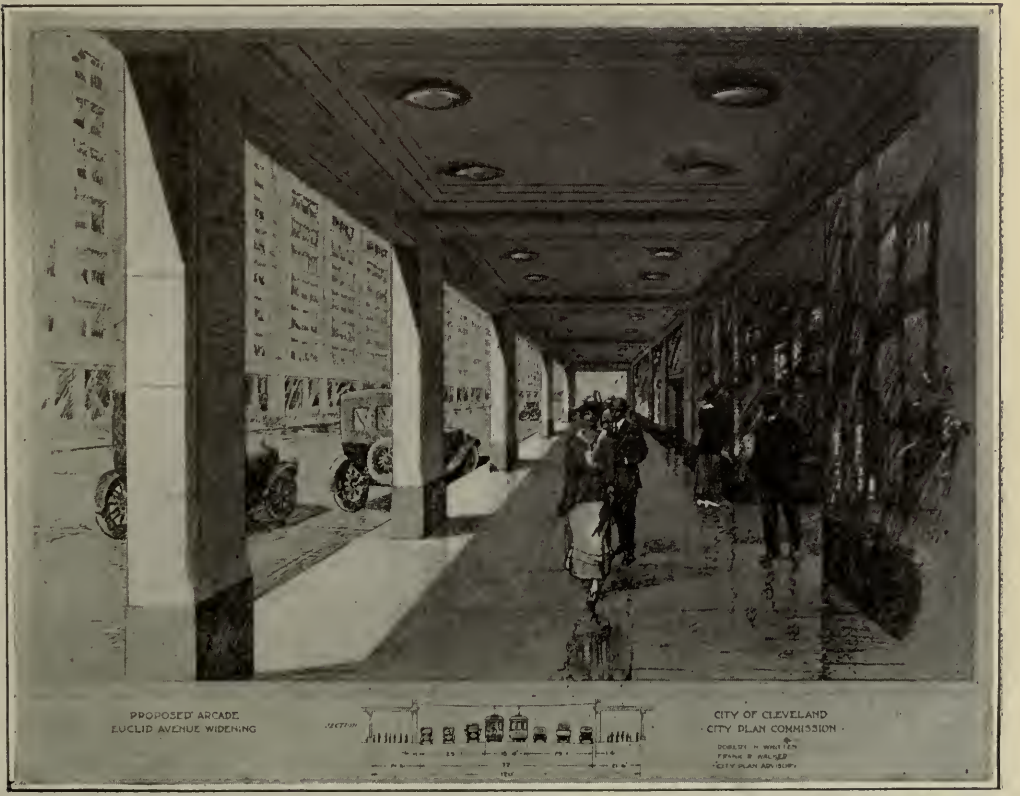
The Use of Sidewalk Arcades in Street Widenings

By Robert H. Whitten
Advisor, Cleveland City Plan Commission

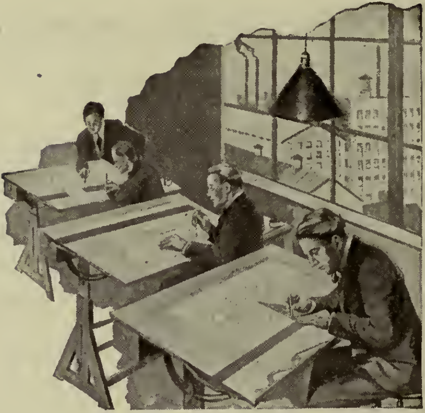
THE Cleveland City Plan Commission has approved a plan for the widening of Euclid Avenue from East 55th Street to University Circle, a distance of a little over two miles. While most of the frontage is now improved with residences standing well back from the street line, three important sections have been developed with business buildings coming clear out to the present street line.

A number of these buildings are substantial structures. In order that the widening may be effected at a minimum expense, it is proposed to leave the present buildings standing, but to push back the store fronts on the first floor and run the sidewalk in an open arcade along and under the front 20 feet of the present buildings. This operation, while expensive, will be very much less costly than cutting off the entire fronts of the buildings. In cutting off the front of office or apartment buildings, suites and offices would be so interfered with as to require a complete reconstruction of the upper floors. With the arcade plan there is no interference with the layout of the upper floors, and if the ground floor is of adequate depth or can be extended in the rear, the construction of the sidewalk arcade can be effected without great damage.

The placing of the sidewalk in an open arcade under buildings is used on several of the finest streets in Paris and in a number of Italian cities. It is also in use near the City Hall in Philadelphia and is to be used in an important street widening improve-



PLAN FOR USE OF SIDEWALK ARCADES IN WIDENING EUCLID AVENUE, CLEVELAND



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ment in St. Louis. The arcade has advantages in a retail business section: it protects pedestrians from rain, snow and slush, and in the warm months furnishes a cool promenade; it may prove attractive from a purely business standpoint, and will be at least interesting architecturally.

Under the proposed plan for widening Euclid Avenue, approximately the entire present width of the street between buildings, 80 feet, will be used for roadway purposes.

A Successful Community Hall at Mount Pleasant, Calif.

By E. E. Burnet

THE idea of the Hall originated in the Farm Bureau meetings which were held previous to October, 1917, in the schoolhouse. Men of various dimensions had to adjust their anatomies to fit into the seats of the different sizes of school children. It was far from satisfactory, and there were no facilities for holding public entertainments.

After going through the usual preliminary work of organization, etc., it was decided to build a hall with a floor 46 feet by 78 feet, having a 16-foot stage at one end. This made the total length of the building 94 feet. On the front side there is a covered porch with a ticket office on the right of the entrance and a checking room on the left. Beyond this there is a "men's room" 18 feet square and at the opposite end a "ladies' room" of the same size. The stage is equipped with drop curtain, scenery, dressing rooms and footlights. There is a dining room 18 feet wide along the entire length of the rear of the building with seating capacity of 250. A completely equipped kitchen 20 feet square is located beyond the dining room in the center of the building. The whole building is lighted with acetylene. At the present time the grounds consist of 2 acres covered with live oak timber.

In order to finance the undertaking the association was incorporated as "an association not for profit," the bank taking a note for $3,500. This just about put up the building. The purchase of equipment—piano, seats, dishes, etc.—brought the total indebtedness up to over $5,500, since which time over $1,000 more has been spent.

To pay this off, monthly dances have been held. At the present time the association owes the bank $2,000 and has about $500 cash on hand. It is hoped to reduce the note to $1,500 before Christmas.

Three years ago Mt. Pleasant was unknown. Even in this county comparatively few people seemed to know where it was. Now it is famous all over the northern part of the state. The Hall has brought the people out and enabled them to get acquainted. On account of the travel over the roads, to and from dances, etc., the Supervisors have given our highways more careful attention. It is safe to say that the "esprit de corps" of the neighborhood has been raised very considerably. Aside from the dances, the Hall is the local gathering place. All the meetings of the neighborhood are held there, including the Farm Bureau.

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AC-11-20

Municipal Power Plant a Success in Seattle

Able Administration and Publicity Effectively Back the Mechanical Plant

By Harold Crary

Assistant Publicity Director, Chamber of Commerce and Commercial Club, Seattle, Wash.

INDICATIVE of the success of the municipal light and power plant in Seattle is the announcement that the city is to go ahead with a new Cedar Falls powerhouse, designed to accommodate machinery to develop 20,000 additional horse-power. This unit will cost $1,000,000 and is independent of the great power development on the Skagit River, where the city is to build a power plant which will cost $6,000,000, to meet all future demands of industries for power.

In the lobby of the Treasurer's Office at the Court House is an illustrated placard giving in brief a statement of the development of the city light plant to date. A full realization of the meaning of the figures there shown should certainly have a quieting influence upon the taxpayer who comes with a deep sense of injustice in his heart, and blood in his eye. The original plant, completed in 1905, cost $680,000, and had a capacity of 2,400 kw. The present plant, including the distributing system, represents a cost of $14,000,000, and employs from 350 to 450 men. Seattle has 15,633 street lights, making 900 miles of ordinary lights and 28 miles of cluster lights. In April, 1908, the city light plant had one customer; during the year following it gained 7,500 customers; in 1912 this number had grown to 29,000, while at the present time there are 65,000 customers, giving an annual business of $2,500,000.

The most significant statement on the placard is the following: "The rate to consumers of electric light in Seattle in 1905 was 8½ cents per kw. hour. In 1920 the rate is 6 cents per kw. hour."

This saving of 2½ cents per kw. hour to the taxpayers and consumers of light in Seattle represents practically the difference that exists at this time between the rate prevailing in this city and the average rate in other cities of the United States, where the average maximum residence rate will be found to approximate 8 cents. Thus Seattle enjoys a saving of 2½ cents as compared with other cities. Considering the fact that Seattle consumed in 1915 in its residence district approximately 15,000,000 kw. hours, these figures, from the city light plant and Puget Sound Traction, Light & Power Company combined, represent a total cash saving of $375,000, or almost 10 per cent of the total revenue derived in 1915 from the tax imposed upon Seattle proper. The commercial consumption of light was twice as much again in 1915, making a total saving in both residence and commercial lighting of approximately $1,000,000, which would be 25 per cent of the tax revenue.

During the last five years there has been an unprecedented increase in the amount of light and power used, and the figures of 1915 are quoted merely to show the saving made when the population of the city was less and factories were using less power.

Aside from the saving to the private consumer, which is either directly or indirectly a saving to the taxpayer, Seattle has some of the best lighted streets on the Continent. The use of cluster lights has practically succeeded the arc light, and the city pays from its general fund for street lighting at the rate of 4 cents, or $40 per year for a crossing lamp.

Lighting charges in Seattle are based on a maximum residence rate of 6 cents up to 45 kw. and 2½ cents above that consumption. The maximum commercial rate is 4½ cents and the minimum 1.3 cents.

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"PERFORMANCE COUNTS"

The Effectiveness of County Health Departments

Progressive Counties in South Carolina Find These Departments of Great Value

By L. A. Riser, M.D., Dr. P.H.
In Charge Department County Health Work and Rural Sanitation, South Carolina State Board of Health, Columbia, S. C.

IN South Carolina the value of a county health department in reducing preventable diseases has been clearly demonstrated. The first county health department was organized in this state four years ago, in Orangeburg County. Three other counties organized health departments, but were not far-sighted enough to continue them. There are at present eight flourishing county health departments in the following progressive counties: Orangeburg, Darlington, Lee, Calhoun, Fairfield, Charleston, Newberry and Cherokee.

Improved Statistics Show Good Results of Work

The first year's work in a county usually shows a presumably higher rate of preventable diseases. This is due to better reporting, and the second year a decline is shown. Orangeburg, one of the largest and most populous counties in South Carolina, has, in two years, reduced her typhoid death rate 40 per cent. Two adjacent counties where there are no county health organizations show reductions of 20 and 16 per cent respectively; one county shows no change, one shows an increase of 25 per cent, and another an increase of 116 per cent. Darlington County shows, in two years, a reduction in typhoid of 57.9 per cent, while in all adjoining counties where no health departments exist there is an increase of typhoid ranging from 5.9 to 50 per cent.

The county health departments are carrying on an educational crusade against all intestinal diseases, as a group, by encouraging improved and safe sanitation and water-supplies, and against all other diseases which are preventable. Not only have intestinal diseases decreased, as shown by the above figures, but the statistics show that this also applies to all other preventable diseases.

Departmental Organization

The county health department in South Carolina consists of a doctor, a nurse, two or more sanitary inspectors, and a colored

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nurse or social worker, all giving their full time. These workers are paid by the state, the International Health Board and the county, and the county budget is often supplemented by funds from other organizations, such as the State Tuberculosis Association, the King's Daughters, etc. In two counties the local Red Cross has assisted by furnishing cars for the nurses. The inspectors visit from house to house, make inspections and urge sanitary reforms and supervise the construction of sanitary closets. Through them the Department often learns of cases of preventable disease which have not been reported.

The health officer supervises all work. He gives illustrated lectures, makes examinations of school children at the annual inspection, gives anti-typhoid inoculations and smallpox vaccinations. He is the quarantine officer, has charge of any epidemic and investigates any cases of contagious disease. This work is free alike to both colored and white. The nurses and social workers visit in homes and do follow-up work after the county health officer has examined the school children and found the defective ones. They visit where there are prospective mothers and new-born babies. They organize mothers' clubs and make visits to all cases of typhoid fever, tuberculosis or other preventable diseases reported by the inspectors. They also administer treatment for hookworm disease. In Lee County $500 has been raised for use in free treatment of any defective school children unable to pay for treatment.

The Work Accomplished

During the past three months sanitary closets have been constructed at 425 homes, and 1,359 homes have been screened; 7,462 homes were personally visited by members of the staff of the County Health Department, and some health subject, according to its need, was discussed with the head of each household.

On the first day of June the State Department of County Health Work put on, as an educational feature, a traveling moving picture outfit. A Ford truck, equipped with electric lighting system and a moving picture machine, is being sent into the highways and byways of South Carolina, and

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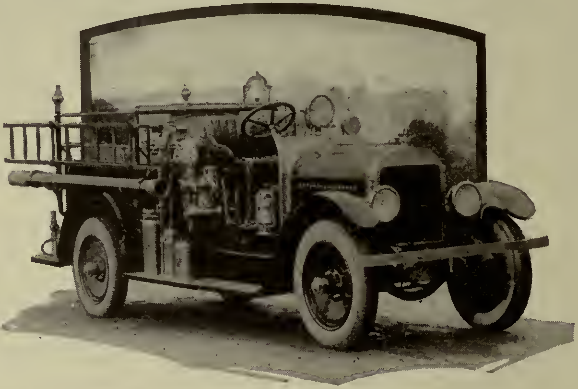

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under the direction of an enthusiastic young medical student is carrying health education to all sections of the state. Two splendid films, one on typhoid and one on tuberculosis, are being shown. These films do not deal with cut and dried facts, but each is an entertaining story which brings the lesson of health in a convincing manner to large and appreciative audiences. During the month of June, 1920, this moving picture unit held twenty meetings and 3,980 people saw these pictures, some of whom had never seen a moving picture before. These meetings have been held in counties which have no health departments, and the people in these communities have been told in what way a county health department would be of benefit to them.

More on the Administration of Water-Works

I NOTE in your September issue an article on administration of municipal water-works. As you make mention of this city, I thought that you would probably be interested in the present situation in regard to the matter.

The city of Cedar Rapids was organized under the commission plan in 1908. Under the Iowa law, in a commission plan city,

> "The council shall have and its members shall exercise all executive, legislative and judicial powers and duties now had, possessed and exercised by the board of water-works trustees, etc."

However, the Iowa law in regard to boards of water-works trustees, where such existed, made them entirely independent of any control by the councils, although the councils could abolish such boards. That is what happened in this city. While this action has been quite recent, nevertheless every member of the Council is thoroughly satisfied that it was necessary for the public good.

I do not at all agree with the writer of your article in claiming that there are increased political influences in handling a water-works plant by the method which we have adopted.

By ordinance the Superintendent is not subject to the control of any one department, but to the Council as a whole. In view of our experience in this city, we feel confident that the office of superintendent will never become a political one, but will simply be one where the incumbent will have to make good. The first man named for the position was selected from a large list of applicants and suggested names, and came from a position with the St. Paul, Minn., Water Department. Again, the officers who have been subject to election by the Council, such as City Engineer, Treasurer, Auditor, Clerk, etc., have all retained their positions regardless of the changing personnel of the Council. I think the officers just named were all elected originally before any of the present City Council came into office, and have retained their positions by virtue of their efficiency. I anticipate the same result in regard to the Superintendent of the City Water-Works.

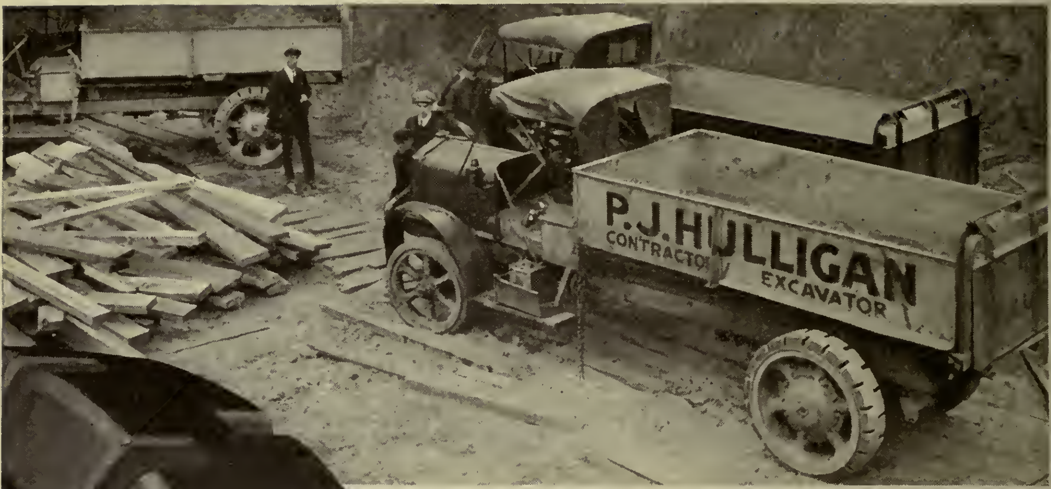
You may ask, "Why the change?" The answer to this is: first, that three men who have their own business cannot give, and did not give, the service which was needed to make a success of the plant, notwithstanding the fact that they made, at least on paper, a splendid financial record. In April last the U. S. Public Health Service prohibited the use of the city water on interstate trains, and the investigation of the reasons therefor demonstrated the lack of proper handling of the plant. In addition to this, the Council discovered that the Board of Trustees were planning large improvements, totalling a good many thousand dollars; that they were making these on their own judgment and absolutely refused to consult competent technical authorities as to the advisability of the changes which they proposed. Their plea was that they were unable to finance a $1,000 expenditure for this purpose, while at the very same time they were paying over $1,100 for a public accountant's audit of the business of the plant.

In view of the fact that under the commission form of government there are five men, at least, in this city who devote all their time to the city's business and could easily give all the necessary time required to supervise the water-works system, with a good man in direct control, it seemed ridiculous to continue the old system.

* * * *

J. F. RALL,
Mayor.

Cedar Rapids, Iowa.
September 28, 1920.



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The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Collection of Paving Assessment Enjoined on Grounds of Insufficiency of Notice of Intention to Make the Improvement

In the cases of Henderson vs. City of Sheridan and Byers vs. City of Sheridan, 191 Pacific Reporter, 350-351, the Oregon Supreme Court has enjoined the collection of paving assessments on the ground of irregularities in the notice of intention to improve.

In these cases a notice of intention to pave was held to be insufficient as failing to specify the character of improvement to be constructed. In the first case the Court says:

"Here the property holder is left entirely in the dark as to the thickness or depth of the improvement which was upon the street, upon which the grade had been established, and which had been theretofore improved only by the voluntary act of the property owners. What are the uncertainties here?

"1. 'The street is to be improved by resurfacing it from curb to curb with a wearing surface of asphaltic concrete pavement.' How thick is this wearing surface to be? The notice does not state, and in the absence of such statement how is the property owner to be enabled to make any estimate of the cost?

"2. The improvement is to be further continued 'by bringing said surface to the proper grade, crown, thickness and wearing surface.' What is to be the proper grade, crown, thickness, and wearing surface?

"What is a 'proper' grade? Certainly not the lawful grade, because none had been established. It is clear, therefore, that what was to be the proper grade, thickness, crown, and wearing surface were matters left still in the breast of the Council or City Engineer, and not disclosed to the abutting property owners, so that they might estimate the expense they were likely to incur, and determine their course in relation to making or not making a protest.

"We are of the opinion that the notice was not sufficiently definite to give the city jurisdiction to make the improvement."

In the second case the Court decided that the notice of intention to pave was defective for insufficiently describing the improvement as a "hard surfaced pavement." In this case the Court said:

"While technical accuracy in detail is not required, the property holder is at least entitled to be informed, in a general way, by city officials who are proposing the improvement, whether it is in the contemplation of the city to pave with brick, stone, bitulithic, concrete, asphalt, or some other material, as, under the notice given, any one of these mentioned—and perhaps others—might be employed. Unless this is done, a property holder has practically no data from which to make even a reasonable guess as to what he may be called upon to pay when the improvement is completed. These general characteristics of an improvement ought certainly to be considered by the authorities before they determine to initiate it, and it is comparatively easy to specify them, and only justice to the ratepayer that he should be apprised of them before being called upon to determine whether or not he will remonstrate."

It is further held in the second case that lack of reasonable certainty in description of improvement in a notice of intention to improve the street went to the jurisdiction of the city to make the improvement, and was not waived by failure of property owners to object while the improvement was in progress, so that the city's plea of estoppel against them was not well taken.

Where Durability of Work Is Not Shown to Be Affected, Municipal Contract is Upheld Even Though Specifications Fail to Conform to Resolution

A municipal contract for concrete street pavement six inches thick will not be regarded as being invalid for non-conformity to a resolution of necessity for the improvement, specifying a thickness of seven inches, holds the Iowa Supreme Court, unless the durability of the pavement will thereby be injuriously affected. (Richardson vs. City of Denison, 178 Northwestern Reporter, 332.) Says the Court:

"It is well known that the depth of concrete

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required for durability depends largely upon climatic condition, the kind of soil, the extent and character of the traffic, and the like, and in the absence of any showing we are unable to say that six-inch pavement will not serve the purposes of this improvement as though it were seven inches in thickness. If it will prove as durable and efficient in use as would seven-inch pavement, we are inclined to the opinion that the little reduction in thickness of one inch, or one-seventh, would not be a material departure from the method of construction prescribed in the resolution. Such a resolution need not describe the material or materials of construction with technical nicety. All that is essential is that it state these in a general way, leaving the details to be wrought out in the plans and specifications."

Certainty of Property Descriptions Essential to Validity of Sidewalk Assessment

To fix a lien upon abutting property for the cost of sidewalks constructed by a municipality, the assessment proceedings must describe the property with such certainty that from the assessment alone it can be located. (Mississippi Supreme Court, Langstaff vs. Town of Durant, 84 Southern Reporter, 459.)

Municipality Held to Have Power to Act as Trustee of a Public Charitable Trust

A Kansas municipality has power to accept a bequest of a trust fund and to administer it in perpetuity if the purpose of the trust is for a public, charitable use. A fund is for a "public, charitable use" where its purpose is to buy food and fuel for needy and deserving inhabitants of the municipality to which the trust fund is bequeathed and by which it is to be administered, or where its purpose is to aid any deserving person suffering from cancer to secure treatment for that disease in its early stages.

The foregoing is the gist of the decision handed down by the Kansas Supreme Court in the case of Treadwell vs. Beebe, 190 Pacific Reporter, 768. The Court quotes approvingly the following language of a standard legal authority:

"A municipal corporation may act as trustee of a charitable trust where the trust created is germane to the purpose for which the corporation was called into being, and when the administration of the trust and the liabilities it imposes are not foreign to the objects for which the corporation was instituted. In conformity with this rule it has been frequently declared that a municipal corporation may act as a trustee of a charitable trust for the support or establishment of free or public schools within the muncipality. Some courts take the view, however, that a municipal corporation cannot act as trustee of a charitable trust unless the power to do so is expressly granted or is necessary to the performance of its duties as a territorial and municipal corporation, while other courts maintain the rule that a municipality may act as trustee of a charitable trust when it is not prohibited from so doing by statute. And this is true although the purposes of the trust are not strictly within the scope of the direct purposes of the corporation, but merely collateral thereto." 5 R. C. L. 320, 321.

San Francisco Ordinance Imposing License Fee on Outside Sales of Theater Tickets Held Invalid

The California District Court of Appeal has upset an ordinance of the city and county of San Francisco imposing a license fee of $300 per month on the business of "peddling" tickets to places of amusement or entertainment, covering sales other than at the offices of the management of such places. (Ex parte Dees, 189 Pacific Reporter, 1050.)

"Considered as a revenue measure," says the Court, "the section under consideration, if it provides for any tax, provides for one upon single sales, and not upon a business. It further is directed to a mode of selling without consideration either of essential differences in modes or volume of business transacted. It cannot be upheld as a revenue measure for these reasons. . . . As a police measure it is an unwarranted interference with the liberty of citizens of the state and the United States, not based upon any reasonable consideration of the public health, morals, or safety, nor of the cost of police supervision."

Discharge of Sewage into River by Municipal Sewer Unlawful Interference with Rights of Riparian Owners

Applying the statutes of Colorado, the Supreme Court of that state holds in the case of Mack vs. Town of Craig, 191 Pacific Reporter, 101, that defendant municipality had no power to discharge sewage into a river under such circumstances as to interfere with the rights of riparian owners. The Court holds that the conferring on a municipality of power to construct an improvement does not impliedly carry with it

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Absolutely waterproof, making the ideal hose for fire departments.

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authority to condemn private property to that end; and that there is no power to condemn property beyond the municipal boundaries, unless the power has been specifically given. It is further held that the pollution of a stream to the prejudice of owners of land abutting upon that stream constitutes a condemnation of their property rights.

Presumption That Ordinance Has Been Regularly Passed

In the absence of affirmative showing to the contrary, the necessary requirements will be presumed to have been complied with in the enactment of ordinances. (Oregon Supreme Court, Emmons vs. Southern Pacific Company, 191 Pacific Reporter, 333.)

Infancy or Incompetence May Be Valid Excuse for Failure to Give Statutory Notice of Accident

While a provision of a city charter providing that, before the city shall be liable for damages, the person injured or some one in his behalf shall give the mayor or the city auditor notice in writing of such injury within 30 days after the same has been received, stating where and how the injury occurred and the extent thereof, may be valid, failure to give such notice may be excused on account of the incompetency of the injured party by reason of infancy or effect of such injuries rendering him mentally and physically incompetent to give such notice. (Oklahoma Supreme Court, City of Tulsa vs. Wells, 191 Pacific Reporter, 186.)

Construction of Statute Requiring a Majority Vote of Qualified Electors

A statute requiring a majority vote of the qualified electors to determine a question of change in city government which provides no means for determining the number qualified to vote at the election, requires only a majority of the votes cast at the election unless an intention to require a majority of all those qualified to vote is clearly expressed. (Virginia Supreme Court of Appeals, Harrison vs. Barksdale, 102 Southeastern Reporter, 789.)

Motive for Adopting Ordinance

Motive of the council in enacting an ordinance cannot be inquired into; it is enough that the council had the power and acted in the manner prescribed. (Wisconsin Supreme Court, State vs. Baxter, 176 Northwestern Reporter, 770.)

Municipal Milk License Tax with Amount Based on Number of Cows

An ordinance regulating the sale of milk and imposing a license fee on the basis of the number of cows whose milk is marketed in the city is not invalid as amounting to a tax on the cows, holds the Kansas Supreme Court in the case of City of Lawrence vs. Kagi, 185 Pacific Reporter, 60. The Court says:

"The purpose of the ordinance is to regulate the sale and distribution of milk within the city, and, to effect the purpose, provisions are made for inspection, the issuance of permits, and the collection of fees for the permits. In order to pay for inspection and supervision of the milk sold within the city, a license fee is required of $1 per cow for the first ten cows and 50 cents for each additional cow from which the milk sold was obtained. There is no contention that the license fee imposed exceeds the cost of inspection and supervision. While the number of cows is used as a basis in fixing the amount of the fee, it is in no sense a tax on the cows, and it cannot be regarded as an unreasonable or illegitimate charge for police surveillance."

On the Calendar of Conventions

NOVEMBER 9-10.—LETHBRIDGE, CANADA.
Union of Alberta Municipalities. Annual convention. Secretary-Treasurer, J. D. Saunders, Camrose, Alberta.

NOVEMBER 15-17.—CINCINNATI, OHIO.
City Managers' Association. Annual convention. Executive Secretary, Harrison G. Otis, 1812 Tribune Building, New York, N. Y.

NOVEMBER 16-18.—LOS ANGELES, CALIF.
Fire Marshals' Association of North America. Annual convention. Secretary, George H. Nettleton, St. Paul, Minn.

NOVEMBER 17-19.—INDIANAPOLIS, IND.
National Association of Civic Secretaries. Annual convention. Secretary, Francis T. Hayes, City Club, Cleveland, Ohio.

NOVEMBER 17-19.—INDIANAPOLIS, IND.
National Municipal League. Annual convention. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

NOVEMBER 30-DECEMBER 2.—BRANDON, MANITOBA, CAN.
Union of Manitoba Municipalities. Annual convention. Secretary, Robert Forke, Pipestone, Manitoba, Canada.

DECEMBER 6-8.—WASHINGTON, D. C.
American Association of State Highway Officials. Annual meeting. Secretary, Joseph Hyde Pratt, Secretary, State Highway Commission, Chapel Hill, N. C.

DECEMBER 8-10.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual congress. Secretary, S. A. Thompson, 824 Colorado Building, Washington, D. C.

Helpful Information on Cold Weather Concreting

The coming season will see, as previous cold weather seasons have seen, a marked increase in concrete building.

A really long list of concrete improvements can be constructed indoors, in shops, barns or warehouses, and placed later—posts, bases and small foundations, slabs, beams and other precast units, tanks, troughs, etc. And outdoor work is perfectly practical with some easily observed precautions. The probabilities of better transportation facilities and better labor supply and the advantage of having a building ready for spring more than warrant the small additional cost.

Standard directions and specifications for cold weather concreting will be sent free of charge or obligation. Ask also for the ALPHA handbook on concrete construction—if you haven't one—and for the sheet or bulletin in the list below that is of special interest.

Workingmen's Homes
Walkway and Driveway
Roads
Small Bridges
Culvert
Foundation
Gutter and Curb
Storage Cellar
Spring House
Small Dam
Milk House
Ice House
Manure Pit
Septic Tank
Oil Storage Tank
Tennis Court
Concrete Roof
Barn and Silo
Corn Crib
Storage House
Smoke House
Hog House
Poultry House
Dipping Vat
Tanks
Piers for Small Boats
Garden Furniture
Greenhouse
Coal Pocket
Fence Post
Gate Post
Walls, Sills and Lintels
Garages
Overcoating of Old Dwellings
Porch, Cellar and Stable Floors
Industrial Tanks

We are obliged to ask inquirers who live west of the Mississippi River to send fifty cents to cover cost of publishing and mailing of our literature. Refer to American City.

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General Offices: **EASTON, PA.**

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New York Philadelphia Boston Pittsburgh
Baltimore Savannah

Municipal and Civic Publications

HYDRAULIC TABLES.

Gardner S. Williams and Allen Hazen. Third Edition, Revised and Enlarged. John Wiley & Sons, Inc., New York. 1920. 115 pp.

The third edition of Williams and Hazen's Hydraulic Tables, generally accepted as standard by most waterworks and hydraulics engineers, contains additional data not included in earlier editions. The chapter on "Additional Data" discusses the possible need of change in two exponents and one coefficient of the Hazen and Williams formula for the flow of water in pipes. Examination of data acquired in the eighteen years since this formula was first used shows that there is no need of change in either the exponents or the coefficient.

ORDINARY FOUNDATIONS.

A Practical Treatise on Engineering and Building Foundations, including Sub-aqueous Foundations.

Charles Evan Fowler, Mem. Am. Soc. C. E. Fourth Edition, revised and enlarged. John Wiley & Sons, Inc., New York. XXXI + 531 pp. Tables and illustrations.

This book is specially written for the engineer who has not had the fortune to amass a large amount of data from personal experience. All data are based on actual experience, and the advice, caution and dependability of this book make it of great value to municipal and other engineers called upon to furnish designs and specifications in ordinary foundation work.

MUNICIPAL YEAR BOOK.

The Municipal Year Book of the United Kingdom for 1920-21. Robert Donald, Founder and Director. Published by the Municipal Journal, Ltd. XXV. + 538 pp. This is the first appearance of the Year Book for five years. All of the main features of earlier editions have been retained and rewritten. The sections relating to Electricity Supply and Tramways have been recast to make the tables of statistics uniform with those relating to other municipal undertakings, and a new table showing the results of the operations of municipal omnibus services have been added. Another new feature is the section devoted to special features of municipal enterprise in various towns. (Apply to the Municipal Journal, Ltd., Sardinia House, Sardinia St., London, W. C. 2.)

HAND BOOK OF FIRE PROTECTION.

Everett U. Crosby, Henry A. Fiske, H. Walter Forster. Sixth Edition. D. Van Nostand Company, New York City. 1919. XXXV + 757 pages. Illustrated.

A valuable handbook for the municipal official interested in the many phases of fire protection and prevention. The book is replete with excellent data, including the fundamental principles of fire protection, common fire causes, spread of fire, building construction as a preventive, private and public fire protection, and sprinkler services.

TRAVELING PUBLICITY CAMPAIGNS.

Mary Swain Routzahn. Russell Sage Foundation. New York. 1920. 151 pp. Illustrated. Bibliography, and reference lists of train, truck, trolley, and other traveling campaigns.

Accounts of some typical traveling campaigns are combined with suggestions on the various factors which enter into the success of an educational tour. The book is plentifully illustrated with photographs showing how some of the trains and trucks are fitted up with displays and equipment for demonstrations. Some of the technical problems of arranging and displaying exhibits to advantage in car interiors are pointed out. The program of events at each stop, the planning of itineraries and the follow-up work to make sure that results are obtained are all given a considerable amount of space.

COAL STORAGE.

Bituminous Coal Storage Practice, by H. H. Stock, C. W. Hippard, and W. D. Langtry. Published as Bulletin No. 116, Engineering Experiment Station, by the University of Illinois. 1920. 157 pp. Illustrated. Account of experiments, with conclusions. (Apply to H. H. Stoek, Professor of Mining Engineering, University of Illinois, Urbana, Ill.)

CHILD WELFARE

Child Welfare Handbook. Published by the National Child Welfare Association. 35 pp. Illustrated. With descriptions of the posters available for child welfare exhibits. Apply to Charles F. Powlison, General Secretary, Educational Building, 70 Fifth Ave., New York City.)

The publications listed above are for sale by their publishers. Those listed below are understood to be free upon application.

ELECTRIC LIGHT AND POWER.

Central Electric Light and Power Stations, with Summary of the Electrical Industries. Census report for 1917. 184 pp. 1920. Report on electrical industries, including electric railways, telephones, telegraphs, and municipal electric fire-alarm and police-patrol signaling systems. (Apply to Sam L. Rogers, Director of the Census, Washington, D. C.

SPILLWAYS.

Spillways for Reservoirs and Canals, by A. T. Mitchelson, Senior Irrigation Engineer. Published by United States Department of Agriculture as Bulletin No. 831. 40 pp. Illustrated. 1920. Detailed discussion of spillways, with special emphasis on the syphon. (Apply to Department of Agriculture, Washington, D. C.)

HIGHWAY MAINTENANCE.

Compiled by J. T. Donaghey, Maintenance Engineer. Wisconsin Highway Commission, Bulletin No. 11. 102 pp. Illustrated. 1920. Information on the patrol maintenance of the state trunk highway system. (Apply to J. D. G. Mack, State Chief Engineer, Madison, Wis.)

HEATING.

Emissivity of Heat from Various Surfaces. By V. S. Day, Research Assistant, Engineering Experiment Station. Published as bulletin No. 117, University of Illinois. 39 pp. Illustrated. 1920. Gives results of comparative tests on covered and uncovered sheet metal surfaces, made in connection with the Warm Air Furnace Investigation. (Apply to Engineering Experiment Station, Urbana, Ill.)

MOTOR VEHICLES.

State Restrictions on the Size and Weight of Motor Vehicles. 2 pp. This information is based on state motor vehicle laws in force on July 1, 1920. (Apply to Motor Vehicle Conference Committee, Marlin Rockwell Building, 366 Madison Ave., New York City.)

MOTOR TRUCKS.

The Evils of Overloading. By Robert O. Patten and F. C. Horner. 8 pp. (Apply to the Motor Truck Committee, National Automobile Chamber of Commerce, 366 Madison Ave., New York City, N. Y.)

ROADS AND LOADS.

By Robert C. Barnett, Am. Soc. C. E. 1920. Descriptions and graphs showing the tractive effort required of trucks under different conditions. (Apply to Motor Truck Committee, National Automobile Chamber of Commerce, 7 East 42d St., New York City, N. Y.)

SANITATION.

The Theory and Practice of Sanitation in Country Places, including the bacteriolytic tank system. By W. Ramsay Smith, M.D., D.S., F.R.S. Permanent Head of the Department of Public Health of South Australia. Fifth Edition. 59 pp. 1920. Illustrated. A detailed description of the dry earth closet system and of the bacteriolytic tank system. (Apply to author, Adelaide, South Australia.)

HIGHWAY ECONOMICS.

Making Highways Pay. By James W. Brooks, Director Educational Bureau, Federal Highway Council. 15 pp. Illustrated. 1920. A brief discussion of the economics of good roads. (Apply to author, 1311 G St., Northwest, Washington, D. C.)

For Heating and Applying under Pressure all varieties of Bituminous Materials, Hot or Cold, for Road Construction, Maintenance or Dust Laying.

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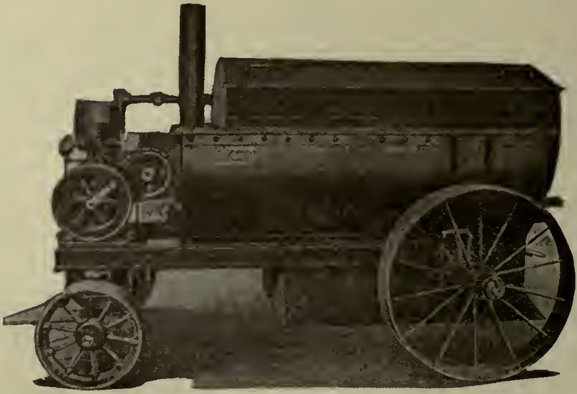

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SAN FRANCISCO

AMERICANIZATION.
An Americanization Program in Education and Recreation. Reprinted from the Observer of June, 1920. 54 pp. Illustrated. The Superintendent's Report of the Chicago Hebrew Institute activities for 1919-1920, with full account of the work accomplished. (Apply to Philip L. Seman, Superintendent, Chicago Hebrew Institute, Chicago, Ill.

Americanization: California's Answer. Issued by the Commission of Immigration and Housing of California. 11 pp. 1920. An account of California's extensive program. (Apply to the Commission, 525 Market St., San Francisco, Calif.)

AMERICANIZATION DICTIONARY.
Compiled and published by Frank L. Dykema, Executive Secretary of the Americanization Society, Grand Rapids, Mich. 63 pp. 1920. Defines naturalization terms and processes for the American who desires to help the alien become a citizen. (Apply to author, address above.)

OHIO STATE REPORTS.
A series of 33 Reports of Field Agents, submitted to the Joint Legislative Committee on Administrative Reorganization, of the General Assembly of Ohio. Includes 29 reports by William H. Allen, Director of the Institute for Public Service, upon various phases of the state educational system. Among these are "Suggestions by City and County Superintendents for Improving Ohio's Education" and "Possible Forward Steps in Ohio's Education without Reorganizing the State Department of Public Instruction." (Apply to the Joint Legislative Committee, Columbus, Ohio.)

PITTSBURGH PLAYGROUNDS.
Study and Recommendations. Reports No. 1 and No. 1-A of the Citizens Committee on City Plan. 1920. Charts, maps, and illustrations. A thorough consideration of the needs of the city with specific proposals for meeting them. (Apply to Citizens Committee, First National Bank Building, Pittsburgh, Pa.)

URBAN UNIVERSITIES.
Fourth Report, a summary of the proceedings of the Meeting of the Association of Urban Universities. 1919. 92 pp. (Apply to Chancellor Frederic C. Hall, Washington University, St. Louis, Mo.)

SOCIAL SURVEYS.
The Social Survey, Its History and Methods, by Carl C. Taylor, Associate Professor of Sociology, University of Missouri. Published as University of Missouri Bulletin, Social Science Series 3. 1919. 91 pp., with bibliography. Presentation of the evolution, methods, and value of the social survey. (Apply to Professor Carl C. Taylor, Columbia, Mo.)

CITY SCHOOLS.
Score Card for City School Buildings, by Professors G. D. Thayer and N. L. Engelhardt of the Department of Educational Administration, Teachers College, Columbia University. 45 pp. 1920. A method of rating school buildings for size, arrangement, etc. (Apply to Teachers College, Columbia University, 525 West 120th St., New York City, N. Y.)

SIGNALING SYSTEMS.
Regulations of the National Board of Fire Underwriters for the Installation and Use of Signaling Systems Used for the Transmission of Signals Affecting the Fire Hazard. 43 pp. 1920. (Apply to W. G. Richmond, National Fire Protection Association, 87 Milk St., Boston, Mass.)

UTILITY RATES.
Public Service Rates in Texas Cities. Compiled by Frank Mann Stuart, Instructor in Government. Published by the University of Texas as Bulletin No. 1971. 1919. 191 pp. This bulletin is purely informational, giving rates in detail, without comment or conclusion, and is offered as an incentive and basis for investigation. (Apply to Frank Mann Stuart, University of Texas, Austin, Tex.)

SOIL MOISTURE.
Capillary Movement of Soil Moisture, by Walter W. McLaughlin, Senior Irrigation Engineer. United States Department of Agriculture Bulletin No. 835. 1920. 70 pp. Account of experiments and results observed. (Apply to the Department of Agriculture, Washington, D. C.)

WATER ANALYSIS.
Turbidity Standard of Water Analysis, by P. V. Wells, Associate Physicist, Bureau of Standards. Scientific Papers of the Bureau of Standards, Department of Commerce, No. 367. 1920. 28 pp. Illustrated. Experimental studies and conclusions. (Apply to Department of Commerce, Washington, D. C.)

LETCHWORTH VILLAGE.
Eleventh Annual Report of the Board of Managers of the Letchworth Village. State of New York Legislative Document No. 104. 54 pp. Illustrated. 1920. Account of the work at this state institution for the mentally deficient. (Apply to Charles S. Little, M.D. Superintendent, Letchworth Village, Thiells, N. Y.)

MUNICIPAL PENSIONS.
Tentative Recommendations of the Pension Laws Commission, Milwaukee, Wis., 1920. Reprinted from the Annual Report of the Harbor Commission. 67 pp. A discussion of the theories of municipal pensions and a detailed account of the system proposed for Milwaukee. (Apply to Ernest W. Heller, Secretary, Pension Laws Commission, Milwaukee, Wis.)

PROBATION.
The Progress of Probation, by Edwin J. Cooley. 1920. 36 pp. An account of the development and accomplishments of probation in the Magistrates' Courts of New York, particularly during the last four years. (Apply to Edwin J. Cooley, Chief Probation Officer, New York City.)

COÖPERATION.
Farmers' Coöperation in Minnesota, 1913-1917. By John D. Black and Frank Robotka, Division of Research in Agricultural Economics. Published as Bulletin 184, the University of Minnesota Agricultural Experiment Station. 1919. 62 pp. A thoroughgoing account of the development of the rural coöperative movement in Minnesota. (Apply to John D. Black, Ph.D., Agricultural Economist, University Farm, St. Paul, Minn.)

SOCIAL RESEARCH.
Announcement of the New School for Social Research, for the year 1920-21. 21 pp. Prospectus of the school, and courses of study. (Apply to Miss Emma Peters Smith, Secretary, 465-69 West 23d St., New York City.)

PLUMBING.
Report of the Special Plumbing Board of the Massachusetts Department of Public Health. 1920. 73 pp. Map. Account of conditions discovered, with recommendations for standardization. (Apply to Professor George M. Whipple, Harvard University, Cambridge, Mass.)

Municipal Reports

Cambridge, Mass.—Zoning for Cambridge. Report of the Planning Board. 1920. (Apply to Arthur C. Comey, Consultant on City Plan, Harvard Square, Cambridge, Mass.)

Fitchburg, Mass.—Annual Report of the Commissioner of Public Works. For year 1919. 72 pp. (Apply to David A. Hartwell, Commissioner of Public Works, Fitchburg, Mass.)

Marquette, Mich.—Reports of the City of Marquette, for the year ended Dec. 31, 1919. Commission Government. (Apply to Harlow A. Clark, Mayor.)

New York, N. Y.—Report of the Sewage Experimental Investigations at West New Brighton, Staten Island, N. Y. 1919. (Apply to Theodore S. Oxholm, Engineer in Charge, Borough Hall, Staten Island.)

St. Paul, Minn.—Annual Report of the Commissioner of Public Works of the City of St. Paul for the year ending December 31, 1919. (Apply to M. N. Goss, Commissioner of Public Works.)

Trenton, N. J.—Annual Report of the City of Trenton, N. J., for the year ending Dec. 31, 1919. (Apply to Edward W. Lee, Director of Finance and Revenue.)

Waltham, Mass.—Annual Reports of the City of Waltham, Mass., for 1919, with the second inaugural address of Hon. George R. Beal, Mayor. 247 pp. Illustrated. 1920. (Apply to Henry F. Beal, City Manager, Waltham, Mass.)

Westerville, Ohio.—Fourth Annual Report of the City Manager to the Village Council. 1919. 22 pp. Illustrated. (Apply to Ralph W. Orebaugh, City Manager, Westerville, Ohio.)

FASHIONS CHANGE—

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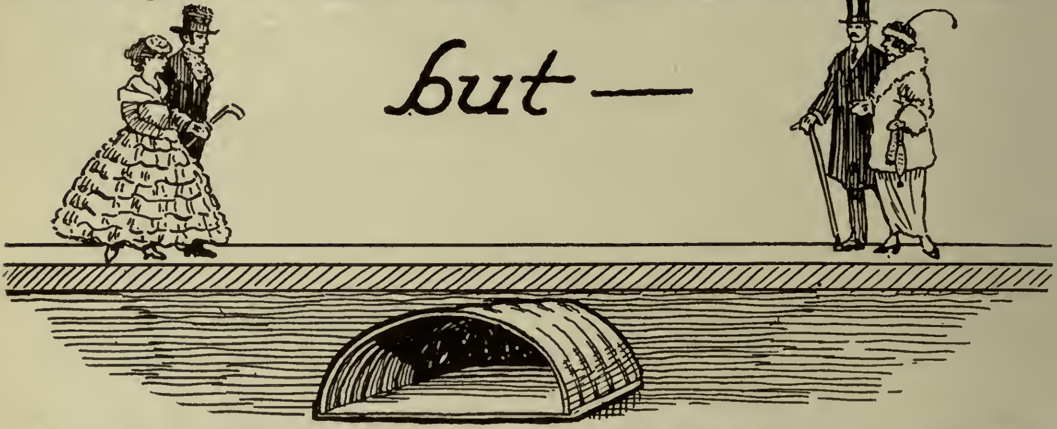

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News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

The Status of Imhoff Sewage Tank Patents

Many inquiries have been received relative to the present status of the Imhoff sewage tank patents, in response to which the Pacific Flush-Tank Company, 4241-3 East Ravenswood Avenue, Chicago, Ill., has prepared an instructive statement which we feel sure will be of interest to our readers.

When Dr. Carl Imhoff first secured his patent in this country, it was his idea that the United States could be served best by representatives in touch with all sewage disposal work, who were at the same time in no way engaged in the design or building of such plants. The Pacific Flush-Tank Company was recommended to Dr. Imhoff, and arrangements were made that this company should look after his commercial interests but assume no responsibility for the design or operation of plants. The company continued its connection with these patents for Dr. Imhoff until shortly before the United States declared war, and then ceased all activities until the patents were seized by the Alien Property Custodian. Arrangements were made at the same time with the Federal Trade Commission, and because this company was in touch with the situation and could continue to serve, it was given a license to continue to act in the collection of royalties under practically the same plan as formerly, except that all collections were turned over semi-annually to the Alien Property Custodian.

The Imhoff patents, together with all other German patents seized by the Custodian, were sold some time ago to the Chemical Foundation Corporation, and it is understood that the title at present rests with that corporation. The Pacific Flush-Tank Company, however, has not surrendered its license from the Federal Trade Commission and does not expect to do so until a treaty of some kind has been signed and the titles cleared up beyond question. Those who have paid royalties since the war are fully protected by the United States Government, as all such royalties are paid over to the Alien Property Custodian in accordance with the license held by the Pacific Flush-Tank Company, which acts solely for and in behalf of the Federal Government. In so acting, the license requires the company to schedule and report to the Federal Trade Commission on all Imhoff tank constructions with which it comes in touch, and to invoice and collect royalties for such construction in accordance with the table of royalties which is made a part of the license.

Many city officials have written to this company stating that they have paid over a sum of money to the Septic Process Protective League and have received a release from liabilities for infringements of the Cameron patents (expired) and were not liable for further royalty. The Pacific Flush-Tank Company wishes to make it plain that payments to the Cameron Company in no way release from liability those who have built two-story Imhoff tanks, as the patents are quite separate and distinct.

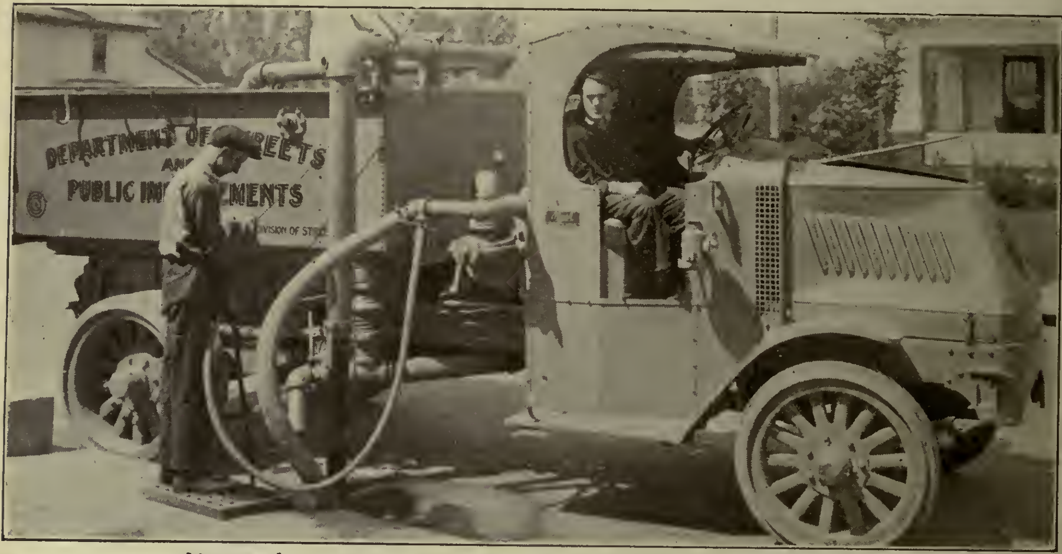
A New LaFrance Lantern

A new electric lantern, which will appeal to all those who have to carry a light, has been placed on the market by the American-La France Fire Engine Company, Elmira, N. Y. This lantern is water-proof, and is absolutely safe to use around inflammable material of any kind. It is an ideal light for watchmen, firemen, sportsmen or automobilists. All metal parts are of brass and aluminum, accurately machined and nicely finished. The silvered reflector is large and designed to throw a wide working light with a strong, far-reaching beam for smoke, fog or long-distance work. A focussing device permits of changing the beam while the light is burning.

The light is controlled by a strong spring

A NEW ELECTRIC HAND LANTERN

THE OTTERSON AUTO-EDUCTOR
CLEANS CATCH BASINS
Saves Time—Money—Labor



Mounted on any 5-TON Chassis of suitable standard make.
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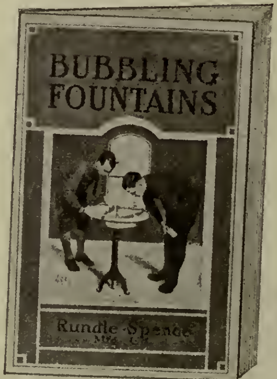

Our new 74 page drinking fountain catalog C., fully describing our "Vertico-Slant" drinking fountain will be sent you on receipt of your name and address.

Ideal for schools, public buildings, parks and streets and factories.

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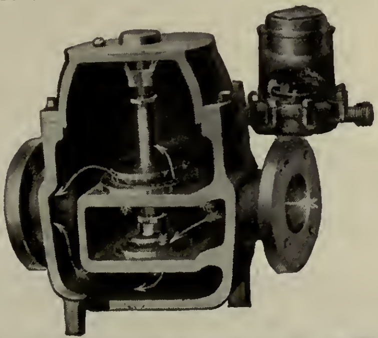
snap switch, conveniently located and positively spark-proof. The current is supplied by two standard dry cells, obtainable anywhere. This lantern will give months of intermittent service. The finish is regularly in red with black and polished brass trim, but furnished in other colors or polished aluminum if desired. A bracket for mounting is furnished at a slight extra cost, a plain bracket for the wall, truck or boat, and a special heavy brass bracket with a spring lock for fire apparatus.

TRUCK WITH TANK MOUNTED FOR SPRINKLING

Building a Compound Meter

In many cases where large water meters are already in use, but it is desired to increase revenue by securing registration on small flows, a Union compounding valve, manufactured by the Union Water Meter Company, Worcester, Mass., may be installed. In this way a complete and efficient compound meter is made at much less cost through saving for use a meter perfectly satisfactory on the flows it was designed to register. The increased revenue, as a rule, soon pays for the valve and its installation.

In the Union compounding valve, all bearings are bushed with hard rubber, and the upper and lower valves are of a rubber composition less brittle and less subject to injury from foreign substances than valves of hard rubber or metal. By eliminating all bearing of metal to metal, corrosive action and sticking of the valves are absolutely prevented. The valve may be attached at any convenient point of the outlet pipe of the large meter, provided no service connections are made between the meter and the valve. The inlet to the by-pass meter must be tapped in the inlet side of the large meter. In many cases it has been found easier to tap in the inlet pipe before the large meter just as if a corporation cock was being put in for an entirely new service.



A COMPOUNDING VALVE WITH METER FOR SMALL FLOWS ATTACHED

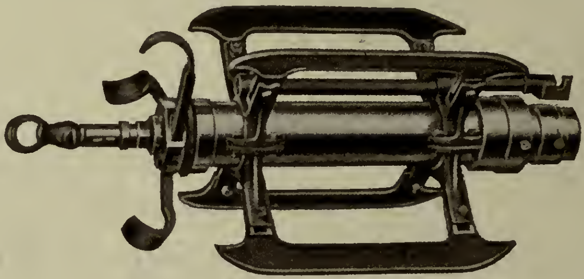
Combined Street Sprinkler and Ash Truck

Versatility is a virtue in human beings which is also recognized as an essential in motor trucks. Some time ago the Autocar Company, Ardmore, Pa., sold one of its trucks to the trustees of Portland Park and Place, St. Louis, Mo. This truck has now been in use for about eleven months, and has proved very versatile through the use of interchangeable bodies which enable it to be used readily for hauling ashes and also for sprinkling. As a sprinkler it has been possible to cover three times the length of road that was previously covered with a horse-drawn sprinkler in the same time. As an ash truck, owing to the short wheel base and its compactness, it has been possible to get into all driveways and congested places where it would be impossible for an ordinary sized truck to turn or reach the ashpits. The Chairman of the Trustees stated in a recent letter: "Regardless of the high cost of gasoline, and in spite of the fact that this truck is doing twice the work previously done with a horse, the expense so far has not exceeded that of the horse, wagon, etc."

Report on Street Lighting Costs

In the September issue of The American City, on page 335, appeared a notice that F. W. Ballard & Co., engineers, Swetland Building, Cleveland, Ohio, had published a valuable report on street lighting costs in the larger cities of the United States of America. In accordance with the usual custom of The American City, no statement as to cost was included, because of current Post Office regulations.

This valuable report is not available for distribution gratis, but may be secured from F. W. Ballard & Co., at the above address, at the price of $2 per copy.



Turbine Sewer Machine

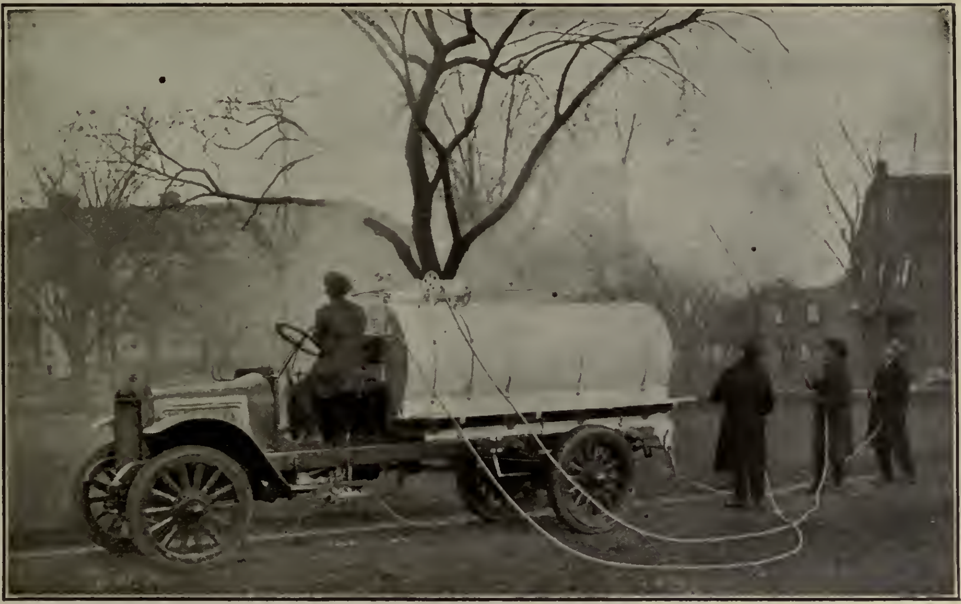
The Turbine sewer cleaning machine will take care of any sized job in a satisfactory manner.....It cleans sewers of every obstruction...

Used with great success by scores of other cities all over the country

Let us demonstrate this machine without any obligation whatever

Write for illustrated book of facts

Turbine Sewer Machine Co
195 ELEVENTH ST., MILWAUKEE, WIS.



A SPRAYING OUTFIT FOR PARKS AND STREETS FOR CITIES PLANNING TO ADEQUATELY COPE WITH INSECT PESTS THAT ATTACK SHADE TREES

A New Motor Sprayer

The spraying of shade trees, shrubbery, gardens and parks in the fall and early spring is indispensable to check the inroads of insect pests. The Republic Motor Truck Company, Alma, Mich., has just placed on the market an orchard sprayer, consisting of a Model 19 Republic truck on which is a 600-gallon tank of 12-gauge galvanized iron mounted on skids, a 35-gallon "Northern" rotary pump, manufactured by the Northern Fire Apparatus Company, Minneapolis, Minn., 20 feet of suction hose and strainer, 100 feet of sprayer hose and couplings, two automatic hose reels, two 10-foot bamboo spray nozzles, and two spray fog guns and all necessary piping. This apparatus may be filled from any available source of water by dropping the suction hose and starting the pump, which operates at the rate of 30 gallons per minute, taking only 20 minutes to fill the 600-gallon tank.

Twenty-four jets at 300 pounds pressure are constantly in operation in the bottom of the tank, providing agitation of such violence as to assure perfect mixing and dissolving of the chemicals used in the spraying.

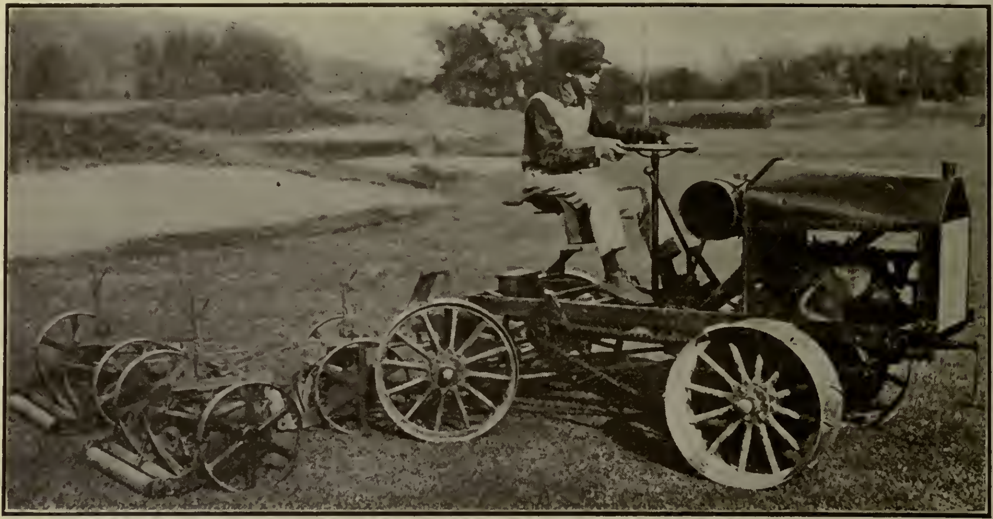
This apparatus may also be used for spraying roads, lawns and gardens, for road oiling, pumping water, dispensing liquid fertilizer and carrying water, and has the additional feature that the tank and spraying equipment may be removed readily by one man, and the chassis, with a standard stake body or farm body, used for ordinary trucking purposes.

Conference of Elgin Salesmen

The annual conference of representatives of the Elgin Sales Corporation, 501 Fifth Avenue, New York City, was held in Chicago, at the Hotel La Salle, October 6 to 9. The Elgin Sales Corporation is a somewhat peculiar one in that the Elgin Street Sweeper Company has no direct connection with its sales agents, its entire output being marketed by the Elgin Sales Corporation. The annual conferences afford an opportunity of keeping alive the community of interest between the three branches of the organization, which is necessary to a successful and harmonious conduct of its affairs. Later the salesmen attended the organization meeting of the International Association of Street Cleaning Officials, mentioned elsewhere in this issue, and inspected the factory of the Elgin Street Sweeper Company at Elgin, Illinois.

Redwood Manufacturers Company

Through an oversight in the September issue of The American City, the name Redwood Manufacturing Company, San Francisco, appeared as one of the subscribing members of the Western Wood Pipe Publicity Bureau. The name should have appeared as Redwood Manufacturers Company, San Francisco, Cal. This company is one of a number of companies in the West which manufacture wood pipe for water systems, full data regarding which may be secured by addressing the Western Wood Pipe Publicity Bureau, White Building, Seattle.



THE WORTHINGTON TRACTOR AND SHAWNEE MOWER

The Shawnee Triple Mower has become the main dependence for parks, golf fairways and lawns of large estates throughout the country.

In combination with the Worthington Tractor it will mow four times as much lawn area as any other mowing apparatus in the world.

The Tractor is especially designed for lawn service. It improves the turf and does not mar or injure the surface. It has patented features which have given it immediate preeminence.

It displaces the horse and reduces the cost of the mowing operation one-half.

The gang mower alone and in combination with a tractor is broadly covered by patents owned by this company.

WORTHINGTON MOWER COMPANY
Shawnee-on-Delaware, Pa.

City Offices and the Monroe

We have but to look through the door of any city office to find quantities of figures, sheet after sheet of them waiting to be multiplied or divided, or otherwise combined. Assessments must be figured for sprinkling, paving, excavating, which means much multiplication and division to find the rate per foot or cost per foot, the assessments per lot or per block; invoices must be extended, percentages calculated, and whenever there is a bond issued, new tables, quite large in size, must be prepared by the Board of Estimate and Taxation.

Everywhere there are tremendous quantities of figures to be handled, and had not rapid progress been made in the calculating machine field, it is doubtful if this mass of work could in any way be kept abreast of the requirements. The mental process of figuring permitted of very few short-cuts; each figure had to be handled individually, each multiplication was a complete operation in itself, each step had to be gone over a second and often a third time for proof, and even then many errors slipped by unnoticed.

But this is all changed to-day with the Monroe, manufactured by the Monroe Calculating Machine Company, Woolworth Building, New York City, for even though a large multiplication requires only a few turns of the crank, a few seconds of time, many simple short-cuts are possible. Methods and systems mean as much in figure-work as in efficient production management. Why should the multiplication of a given amount by 16 percentages require 16 multiplications when they can be accurately determined and proved with a considerably smaller number of operations?

It will be interesting to note how the modern calculating machine facilitates the prompt handling of the work of city offices. Take, for example, the work of the City Auditor's office. Calculations of a similar nature, though applying to different matters, are handled in many other city offices where the two-way mechanism of the Monroe calculating machine plays an equally important part in simplifying the method of arriving at the desired results.

In this office various contract estimates must be checked and totaled, percentages and payments deducted, and the balance due the contractor determined. The items of the estimates involve usually simple extensions, such as 16 crossing plates at $20, amounting to $320, 4,863.2 pounds steel at 12 cents per pound, amounting to $583.58. Occasionally there are items such as 1,265 pounds of material at $17.25 per gross ton, which involve both division and multiplication. Such an item is handled on the Monroe as one operation, both the division and the multiplication being accomplished at the same time.

Where the estimate has already been extended, the City Auditor often desires only a check of the total, and when this is the case, the extensions are made and the total accurately arrived at more rapidly. On the total amount there may be a discount of 15 per cent. To take off this discount it is only necessary, with the Monroe, when the total amount is on the keyboard, to "write" the percentage in the upper dial of the machine, which either adds or deducts the percentage from the total, depending on whether forward or reverse turns of the operating crank are used. To determine the balance due the contractor, it is then only necessary to set the amount of previous payments on the keyboard, and a simple reverse turn of the crank deducts this amount from the total in the lower dial.

A CALCULATING MACHINE FOR CITY OFFICES

Among a great many other kinds of work which the City Auditor has, is the apportioning of interest over several hundred different items. As typical of this work, consider interest to the amount of $11,365.80, which must be distributed over approximately one hundred different accounts in proportion to other items, the percentage of which is known. To illustrate, a calculating machine having a standard adding machine keyboard combined with the two-way mechanism makes possible a method which will shorten work of this nature fully 60 per cent and often as much as 85 per cent.

Suppose the first three of these percentages to be 3.52 per cent, 4.50 per cent, 4.73 per cent. The amount to be distributed is set on the keyboard, where it remains until all items are calculated. The first percentage, 3.52, is then written in the upper dial of the machine with forward turns of the operating crank. Immediately the lower dial shows 400.07 as the amount corresponding to this per cent. The three factors are visible, proving the work. To obtain the amount of the second percentage, it is only necessary to change the first per cent, 3.52, to 4.50. One forward turn of the crank changes the 3 to a 4, two reverse turns of the crank changes the 2 to an 0, and our answer is automatically changed to $511.46. Again there is a proof of accuracy, for the per cent, the total interest and the amount are all visible in the machine. The third item is found in a similar manner: two forward turns of the crank changes the 5 to a 7; three forward turns of the crank in the next position changes the 0 to a 3, and our answer is changed correspondingly.

Estimates of Cost of Proposed Work
Reports on New Improvements
Preparation of Plans
Supervision of Construction

Dams and Reservoirs
Pipe Lines
Filtration Plants
New Water Supply Systems

JAMES P. WELLS

HYDRAULIC ENGINEER

Main Office
219 Cutler Building, Rochester, N. Y.

Branch Offices
In the South, Central West and Canada

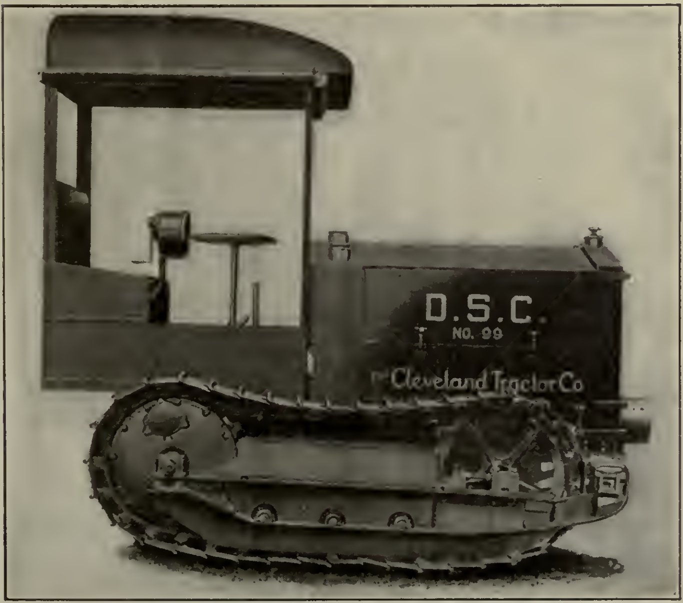
Preventing Snow Tie-Ups

During the month of February, 1920, traffic tie-ups due to unexpected blizzards cost the merchants of New York City sixty million dollars, and the city itself five and one-half million dollars for emergency snow-removal work. Although the Department of Street Cleaning did everything that could be expected of it, the equipment was inadequate to handle the situation, and outside contractors were called in. These contractors failed the Department at the critical time.

Horse-drawn snow-plows and motor trucks were powerless in the deep drifts. None of the equipment owned by the Department, or available outside, was able to handle the heavy fall and packed snow, except a few small tank-type tractors which had been voluntarily offered for the work. These tractors were found equal to the task.

A Snow-Removal Committee was appointed to report to the Mayor on ways and means of handling the snow in the most efficient manner. This committee organized a series of tests during the month of July. All manufacturers of track-laying tractors were requested to compete in this event, a committee having already decided that the track-laying type was the only type able to handle the snow under extreme blizzard conditions. Sand was spread thickly on the pavement in the place of snow, and the tractors equipped with push plows were required to demonstrate their ability to work under blizzard conditions.

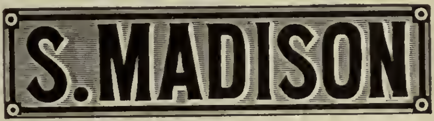
From the results of this demonstration and investigation, the committee decided on the purchase of one hundred small tank-type tractors, fifty large crawler-type tractors, and a big fleet of trucks with dump bodies, together with the necessary push plows, for the tractors. The order for one hundred small tank-type tractors was awarded to the Cleveland Tractor Company, of Cleveland, Ohio, which will supply standard Cletracs equipped with winter tracks, a covered cab, a two-man seat, storm curtains and sirens. These tractors will be painted the characteristic buff and red of the New York Street Cleaning and Fire Departments. They will be delivered in December.



TYPE OF SMALL TANK TRACTOR TO BE USED BY NEW YORK CITY THIS WINTER TO PREVENT TRAFFIC TIE-UPS FROM SNOW

The Need of Durable Street Signs

It is discouraging to strangers in a municipality to try to find their way around and see only dilapidated wooden street signs with the painted name faded out or chipped off, or an enameled sign so badly rusted that it is impossible to read the name of the street. Neat signs that do not rust and that are well-placed so as to be illuminated by near-by lights at night and not hidden by branches of trees either by day or night, are a necessity for the stranger in the locality.



A TYPE OF EASILY READ STREET SIGN

The Niagara Falls Metal Stamping Works, Niagara Falls, N. Y., manufactures embossed sheet metal signs, such as illustrated herewith, which are not difficult to maintain, retain their legibility, and are serviceable for many years.

Can and Bag Carriers for Street Cleaners

Sturdy construction, light weight and compactness are essential in a can and bag carrier for the use of "White Wings." The Tarrant Manufacturing Company, Saratoga Springs, N. Y., includes among its Tarco products a carrier constructed entirely of iron and steel with 30-inch wheels and ⅞-inch axles of solid steel. The carriers are all built for use with a can which rides on a supporting bar at the rear of the carrier. This arrangement eliminates the old-fashioned chain and hook. To use a bag it is only necessary to place one of this company's

A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

Missoula, Montana, is one progressive western city utilizing "ELRECO" Combination Railway and Lighting Poles, which makes separate Lamp Standards unnecessary.

The "ELRECO" Steel Poles support ornamental lighting brackets with modern General Electric Lighting units; also, the span and service wires of the Railway and Lighting Company; keep the streets free and unobstructed from extra Lamp Standards, wooden poles, and a multiplicity of wires, etc.

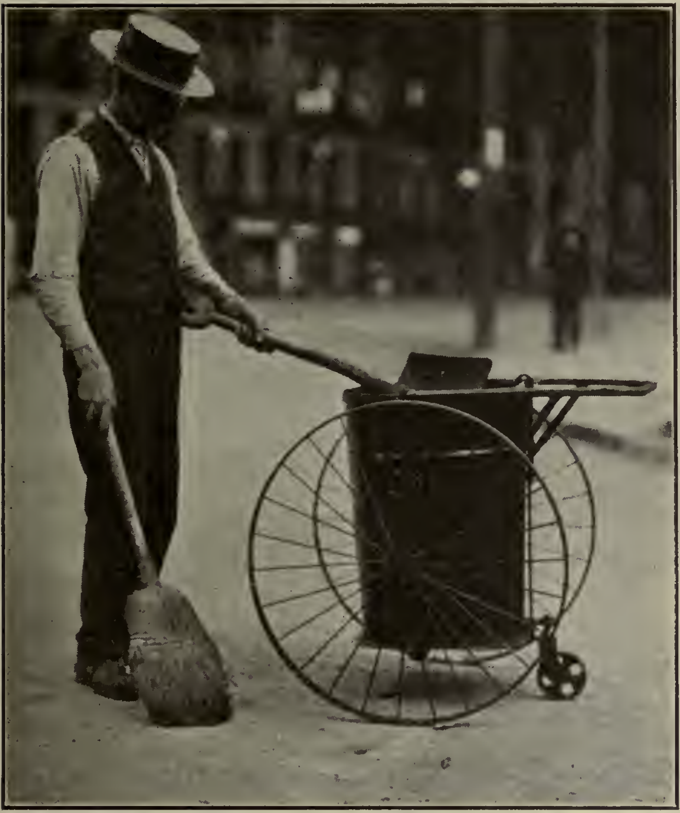
The usual practice of financing such an installation is to divide the cost between the local Street Railway and Lighting Company, Merchants and the City, making the cost of "WHITE WAY" very reasonable.

What other progressive cities have accomplished is well illustrated in our handsome Catalog "F", sent on request to those interested.

Electric Railway Equipment Company

CINCINNATI, OHIO.

New York Office—30 Church Street



A STURDY LIGHT-WEIGHT CAN CARRIER

special holders in position, by slipping the holding rods made for this purpose into the top openings of the tubular frame of the carrier. The change is effected without the use of tools. The bag holder is made of a circular piece of wrought iron, over which the bag folds and is held in position by spring clamps.

The Engineering Business Exchange

It was with great regret that members of the engineering profession throughout the United States learned of the resignation of Charles Whiting Baker, Consulting Editor of *Engineering News-Record*. It is generally felt that the new organization, "The Engineering Business Exchange," of which Mr. Baker is Managing Director, is to fill a long-felt want in the engineering and technical business field.

Many an engineering business has been sold at a sacrifice or has become unprofitable because the owner who wishes to sell has no way of finding a man able and willing to pay a fair price for it and to build it up to a large success. On the other hand, there are many men able to carry responsibility in the direction of a business who are now working in some organization which holds for them little of rich promise. It would be the greatest boon to these men to be placed in touch with business opportunities in the field where their experience lies. It is just along these lines that the Engineering Business Exchange, 30 Church Street, New York City, has been organized, and it is of direct interest to a large circle of engineers and others engaged in the technical industries.

Truck Tires for Municipal Work

We may divide truck tires into three classifications—the solid, the cushion, and the pneumatic. The first two are proved, practical types of truck tires which have been in use for years, and the last is an adaptation to truck service of the passenger car type.

The principal advantage of the large pneumatic is its ability to maintain a high average speed over rough roads, and such tires are therefore best suited to small trucks or those of moderate size carrying breakable goods over rough roads. But garbage and ash removal and other forms of municipal work on the city streets are of the short-haul type, and partake of the nature of the "pick up and deliver" business of the department stores or other concerns which could not efficiently employ high speed of travel because of the frequency of the stops.

Municipal trucks are used for six-day-a-week service and should therefore be provided with the type of equipment which will most surely reduce delays to a minimum. Air-filled tires may fail without warning, and the time required to replace a 200-pound shoe and rim represents a waste of the taxpayer's money, which may well be resented by public-spirited citizens, especially as this cost is in addition to the high initial price of the pneumatic truck tire.

The non-air filled tire, on the other hand, lends itself well to the transportation of various kinds and weights of loads over city streets, is durable and wears gradually, so that its length of service may be determined several thousand miles in advance of its ultimate limit of usefulness.

Durable and economical as the solid tire is, however, its cushioning effect is limited by the restricted ability of the rubber to flow or displace itself when uneven places in the street are encountered. Furthermore, asphalt streets, when wet, offer no traction to a smooth rubber tire, and spinning wheels and dangerous skid-

King Lighting & Trolley Pole

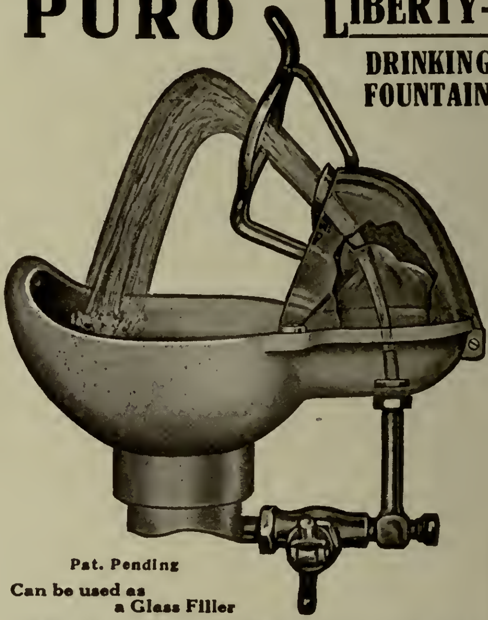
We are prepared to furnish complete combination lighting & trolley pole equipment including brackets & Novalux units

To those interested in modern & economical street lighting, we will send our illustrated booklet Send your name and address.

KING MFG. Co

53 W. Jackson Blvd., Chicago, Ill.

PURO LIBERTY-DRINKING FOUNTAIN



Pat. Pending

Can be used as a Glass Filler

ONLY Sanitary Drinking Fountain

PURO SANITARY DRINKING FOUNTAIN CO.

Haydenville Mass.

No matter WHAT drinking fountain you may put INDOORS

← This

The MURDOCK

PATENTED

☞ ANTI-FREEZING ☜ BUBBLE-FONT

IS THE ONLY ONE THAT IS SAFE TO INSTAL **OUTDOORS** BECAUSE

it is the only drinking fountain made that was designed and is built **solely** for outdoor use. It does not have to be turned off at the approach of cold weather.

THE ONLY FOUNTAIN MADE THAT IS STRONG ENOUGH TO WITHSTAND PUBLIC ABUSE.

Write for fully illustrated literature to

The MURDOCK MFG. & SUPPLY CO.

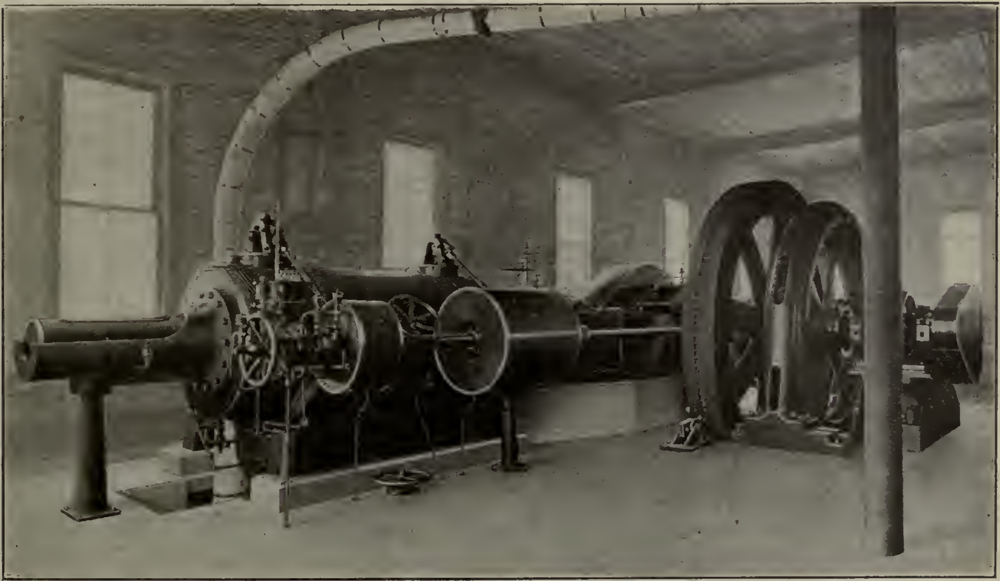
FIRE HYDRANTS
YARD HYDRANTS
HOSE BOXES

CINCINNATI, - - - - - OHIO
Builders of Water Service devices since 1853

GARBAGE AND RUBBISH TRUCKS OF SAN DIEGO, CALIF., EQUIPPED WITH KELLY-SPRINGFIELD CUSHION TIRES

ding may be an accompaniment of all but the most careful driving.

The improved type of cushion, or semi-solid tire, as manufactured by the Kelly-Springfield Tire Company, 1710 Broadway, New York City, possesses the chief advantages of the air-filled and solid types, and is without their principal disadvantages. With deep notches cut into the surface and sides of its specially-compounded rubber to permit the flow of the entire body of the tire when an obstruction is encountered, it cushions the road-shocks and furnishes a forward and side grip on the road which prevents spinning or skidding. Its wear is almost unlimited, thus bringing its cost per mile to a figure considerably below that of the pneumatic. The question of lower initial cost, longer life, etc., favors the semi-solid tire.



NORDBERG-TODD UNIFLOW POPPET VALVE ENGINE IN THE MUNICIPAL POWER HOUSE, PORT WASHINGTON, WIS.

Through an error the wrong illustration was used on page 113 of the July issue of THE AMERICAN CITY. The photograph above shows the correct installation

HABIRSHAW

"Proven by the test of time"

Insulated Wire & Cable

Red Core Wire

HABIRSHAW Red Core Wire is insulated with a special compound developed by experience and scientific research. What a customer wants in insulated wire is long life.

Habirshaw Red Core wire withstands recognized aging tests to a remarkable degree. While it also shows a very high factor of safety in the electrical lists though these are of secondary importance considering the low voltages used in buildings. The life, however, is of supreme importance and Habirshaw Red Core wire is unique in the way it stands both natural and accelerated life tests.

Habirshaw Wire Manufactured by
Habirshaw Electric Cable Co.
Incorporated
Yonkers, New York

Habirshaw Wire Distributed by
Western Electric Company
Incorporated
Offices in All Principal Cities

Habirshaw Power Cables—Rubber—Paper and Varnished Cambric—Sector and Concentric

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Simplex Hard Service Cable

FOR PORTABLE TOOLS AND LIGHTS

Flexible as a lamp cord. Protected by a seine twine braid specially treated to withstand rough use. Recommended for portable tools and lights in machine shops, garages, shipyards and on any engineering or construction work where conditions are severe and continuous service is essential.

Send for descriptive circular No. 1.

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST. BOSTON
CHICAGO SAN FRANCISCO

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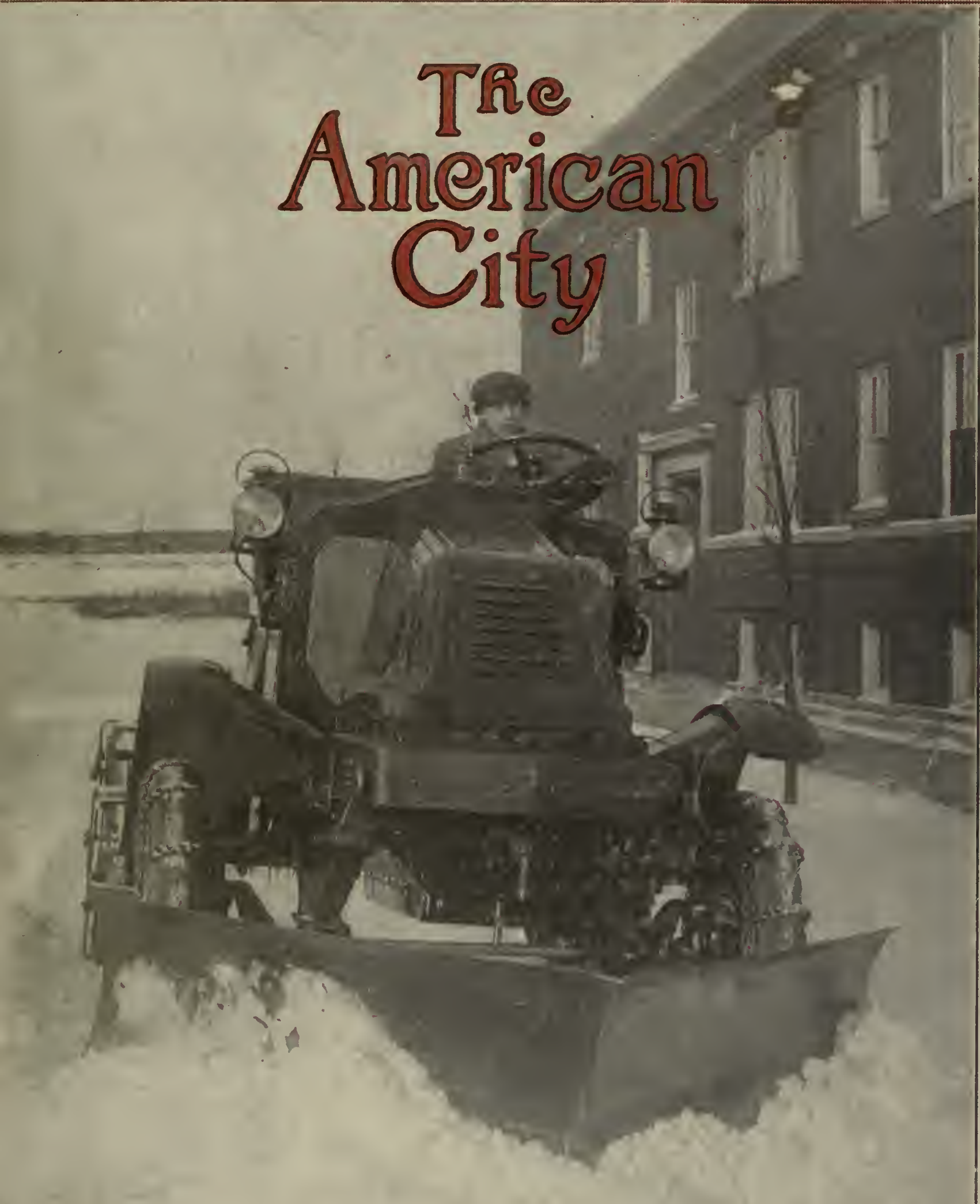
Vol. XXIII No. 6
50 cents $4 a Year

The American City



KEEP YOUR STREETS AND HIGHWAYS OPEN THIS WINTER

Hand Shoveling—Pusher Plows—Blade Graders—Motor Trucks—Tractors

Read "SNOW REMOVAL PLANS" on page 583

This photograph shows a locomotive plow mounted on a motor truck, as used by the South Park Commissioners, Chicago, Ill.

Lower Your City Taxes

Reduce the ...1921... Budget

Promote EFFICIENCY in the Collection and Disposal of

GARBAGE, ASHES and REFUSE

Follow the lead of 17 other CITIES in the United States and install the modern and sanitary

LEE SYSTEM

Eliminates all the objectionable features of the out-of-date wagon system. Reduces collection costs; is adaptable to any situation.

We specialize in all kinds of haulage equipment and our Engineers will solve the refuse collection problem of any Municipality. Our equipment can be used in any city no matter what the population may be.

LEE TRAILER & BODY CO.

2343
So. LaSalle
Street

CHICAGO,
ILLINOIS
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Vol. XXIII THE AMERICAN CITY, December, 1920 No. 6
Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879

VOLUME XXIII
NUMBER 6
The American City
NEW YORK
DECEMBER, 1920

Public Works as Panic-Prevention

JIM SMITH, mill hand, is out of a job. The textile manufacturer, his employer, has been compelled to "lay him off" for an indefinite period because of lack of orders. The manufacturer has human sympathies and is sorry for Jim Smith; but he is a victim of circumstances which he and Jim as individuals are unable to control.

Jim Smith and his family are suffering serious inconvenience from the cutting off of their income. If unemployment continues much longer, the inconvenience will become real privation. But the employer and the workman and their families are not the only victims of the faulty system. The traction company on whose cars Jim had traveled to and from his daily work is collecting fewer fares than before; the clothing shops and food stores at which Jim's family traded are making fewer sales; and even the movies are collecting fewer dimes.

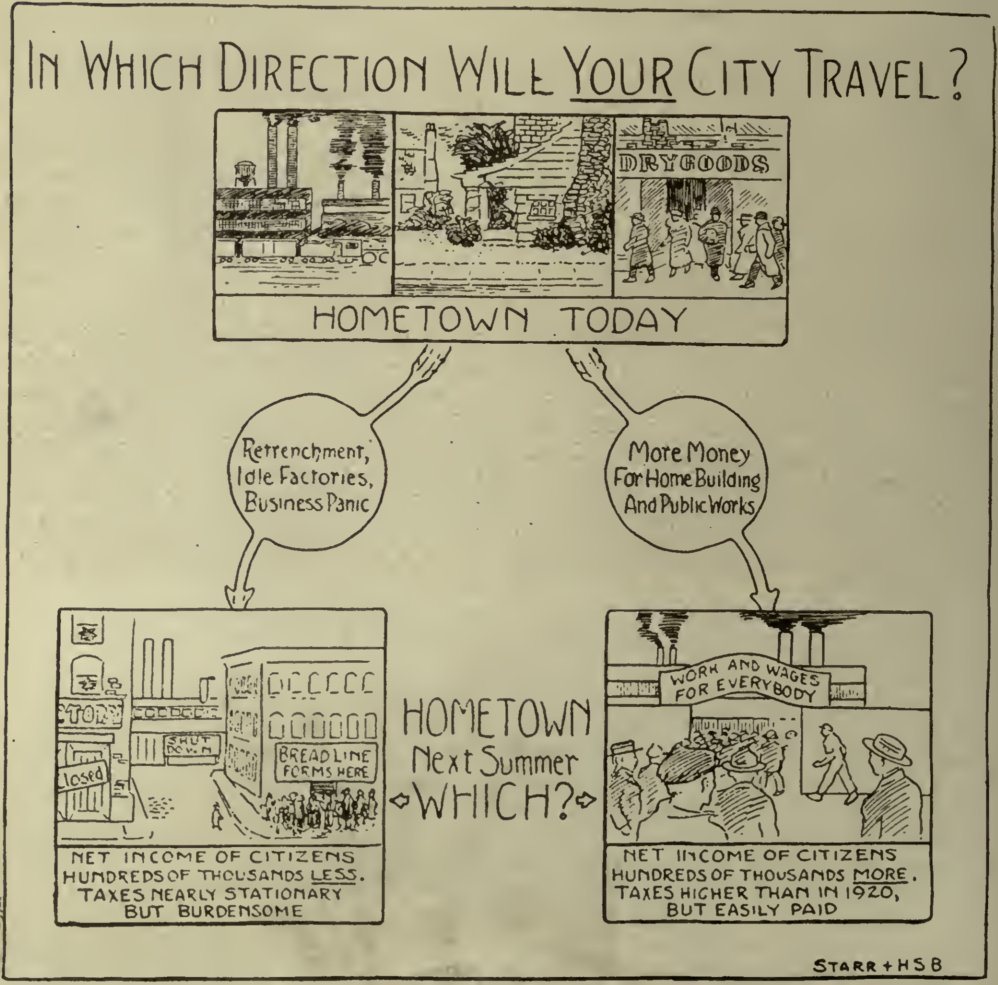
Meanwhile, a lot of able-bodied men in other trades are idle, too, or working part time. Every one of them needs a lot of things he is capable of making and a lot of other things that the rest are capable of making. They all know that any talk of "over-production" is absurd so long as there are unsatisfied human wants vastly in excess of the existing goods capable of supplying those wants. But for some mysterious reason "times are bad" and the processes of production and exchange have become disordered. If Jim, who can weave clothing, and John, who can raise wheat, and Jacob, who can build houses, and a few others like them, were cast on an island with ample natural resources, they would not sit around in idleness waiting for "price readjustment," but would get busy and make things and exchange them, so that each would have as many comforts as all working to the best of their ability could supply.

Sometimes in their days of idleness, these men wonder whether an industrial revolution might not bring about conditions approximating those on the happy island. But the wiser heads among them realize that the socialism or communism that might work well in a primitive society of small numbers would bring only disaster to a twentieth century nation of a hundred million people. These wiser heads have studied the fundamentals of economics and know that wages and capital and interest and rent and profits are founded in the eternal nature of things. But they don't believe that the eternal nature of things requires such extremes of poverty and wealth as are found at present, together with long periods of unemployment and frequent business panics; and unless society shall find some means of overcoming these glaring and needless faults of the existing order, the wiser heads may soon find it impossible to keep the hotter heads from a forcible attempt to try some of the panaceas that the agitators have painted in glowing colors.

So, to provide Jim Smith with steady employment and to devise means of his owning his own home, becomes not only a humanitarian task, but a task whose solution will benefit all with whom Jim's wages would normally be spent, and provide an antidote against the spread of revolutionary propaganda.

And what is the answer? It is partly, of course, in further refinements of our systems of banking, credits, transportation, merchandizing, industrial relations, taxation, and other factors affecting business stability. Jim Smith may hope that these refinements will insure a steady job for his young son some decades hence; but Jim wants a job now, and the public welfare demands that he have a job now. It demands also that our governments—municipal, county, state and national—shall speedily catch up with the construction of public improvements which would have been built ere this but for the setback of the war. The public welfare is in need, too, of millions of new homes to provide decent housing for America's wage-earners. Industrial housing corporations must supplement the work of the speculative builders.

Here, then, is the opportunity for the clear heads to stimulate business by utilizing as many of the unemployed as may be possible in building houses and constructing public works. Maybe part of the cost of the houses will have to be written off some day by the industrial housing corporations that build them; and maybe the roads, bridges, water-works and sewerage systems and other public improvements could be built cheaper a year or two hence; but if meanwhile society is losing the productive abilities of Jim and John and Jacob, and if they have joined the groups who are talking "red" as well as "seeing red," the net loss to society will be vastly greater than any possible shrinkage in values in houses or public improvements constructed at 1921 prices.


In Which Direction Will Your City Travel?
DRYGOODS
HOMETOWN TODAY
Retrenchment, Idle Factories, Business Panic
More Money For Home Building And Public Works
closed
SHUT DOWN
BREAD LINE FORMS HERE
NET INCOME OF CITIZENS HUNDREDS OF THOUSANDS LESS. TAXES NEARLY STATIONARY BUT BURDENSOME
HOMETOWN Next Summer ⇔WHICH?⇔
WORK AND WAGES FOR EVERYBODY
NET INCOME OF CITIZENS HUNDREDS OF THOUSANDS MORE. TAXES HIGHER THAN IN 1920, BUT EASILY PAID
STARR + HSB

REPRODUCED FROM THE DECEMBER 2ND ISSUE OF "COMMUNITY LEADERSHIP"

The Aeroplane and City Planning

The Advantages of Viewing Cities from Above

By Guy Wilfrid Hayler

THE war proved the possibilities of the aeroplane in the way of photography, though the balloon had long been an aid in military science. The balloon had its limitations, and the aeroplane needed to prove itself superior to these. In Great Britain the Royal Flying Corps had endeavored to convince the General Staff of the value of aerial photography, and once this effort was successful, extensive use was made of the new agent.

Since the armistice, aerial photography has been used in England for civil purposes, but not as yet in the preparation of town-planning schemes, though it has been used for purposes of site-planning and building surveys. Considerable attention has been drawn to the subject by the city planners of that country, and the *Garden Cities and Town-Planning Magazine* for April, 1920, devoted a special number to it, "in order to draw attention to its undoubted value in the surveys that are preliminary to town-planning." The magazine stated: "We think the time will soon come when a complete series of aerial photographs of an area to be planned will be recognized to be as essential to town-planning as a contour map or a geological survey."

LOOKING ON THE ENVIRONS OF GREEN BAY, WIS.
Such a view immediately suggests opportunities of suburban development

In France many photographs have been taken from the air by the French Army Aerial Photographic Service, showing the extent of the devastation wrought by invading armies. Captain Bouché of this Service says: "Aerial photographs are most valuable to show the present use of land, the density of population and the relation of open space to built over space. In the devastated regions they have been of the greatest help in making surveys, making it possible to study ensemble improvements, to reparcel property, to verify the lines of plans and to make bird's-eye perspectives of proposed improvements." The matter of aerial photography was considered of such interest as to be the subject of discussion at the sessions of the First Interallied Town-Planning Conference held in Paris last June.

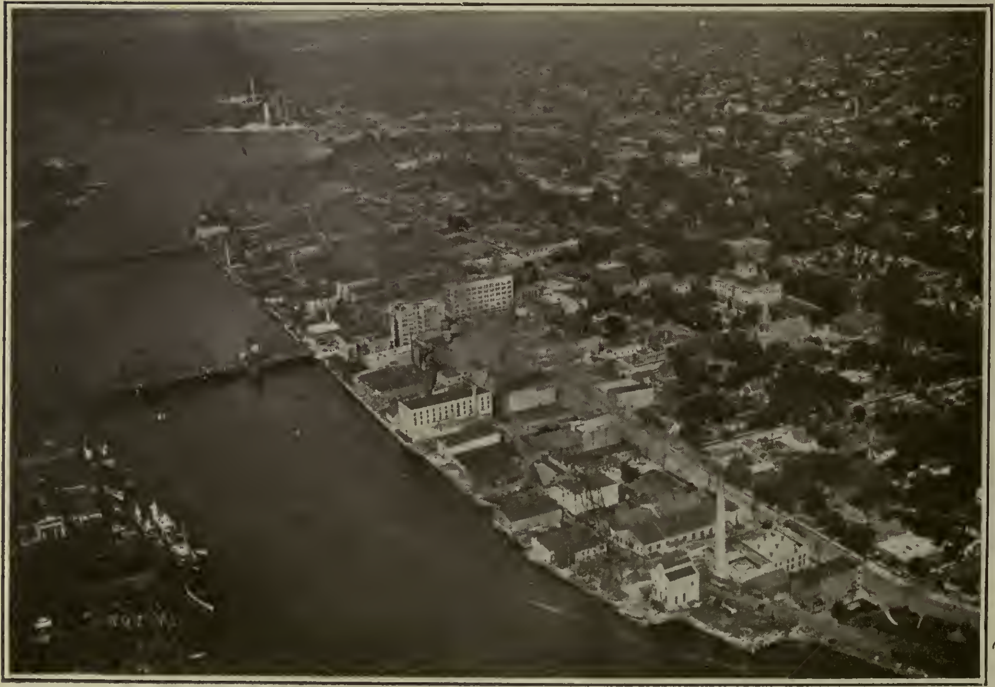
During the war, it has been stated, the advances of the Allies in Mesopotamia would have been nigh impracticable or much more prolonged but for aerial surveys made over country of which no maps were in existence. All this goes to show that there is a field for aerial photography in military work, and with this experience in mind, its extension to civil use is not likely to be long delayed.

For city planning purposes an aerial picture is a speedy and accurate means of producing a record of an area—to scale if required—showing exact conditions. Any detailed survey on the ground to embody even a fraction of as much information would be costly and occupy much time. "Oblique" or "vertical" pictures may be taken, the former showing everything in perspective as it would appear to the eye when standing on a height, and the latter —the vertical picture—showing it on plan, similar to the plotting of an engineer.

Aerial photographs taken of American cities either by aerial photographers or by military or naval men have usually been of the oblique description, although very excellent vertical pictures have been made of Washington, D. C. In many places city planners have learned to use in their work aerial photographs that have been previously taken, but, as far as we are aware, they have not undertaken the work themselves. Planning studies at Dallas, Tex., Chicago, Ill., St. Paul, Minn., Flint, Mich., Niagara Falls, N. Y., and other places, have been considerably assisted by this means.

Aerial City Planning Observations

Apart from photography, of what use can the aeroplane be to the city planner? The author's flight at Green Bay, Wis.,



PART OF THE BUSINESS DISTRICT OF GREEN BAY, WITH FOX RIVER IN THE FOREGROUND

Green Bay is a pioneer in using the aeroplane in planning for the future

DAYTON, OHIO, IS ONE OF THE COMPARATIVELY FEW AMERICAN CITIES THAT HAVE REALIZED THE POSSIBILITIES OF RIVER-FRCNT DEVELOPMENT

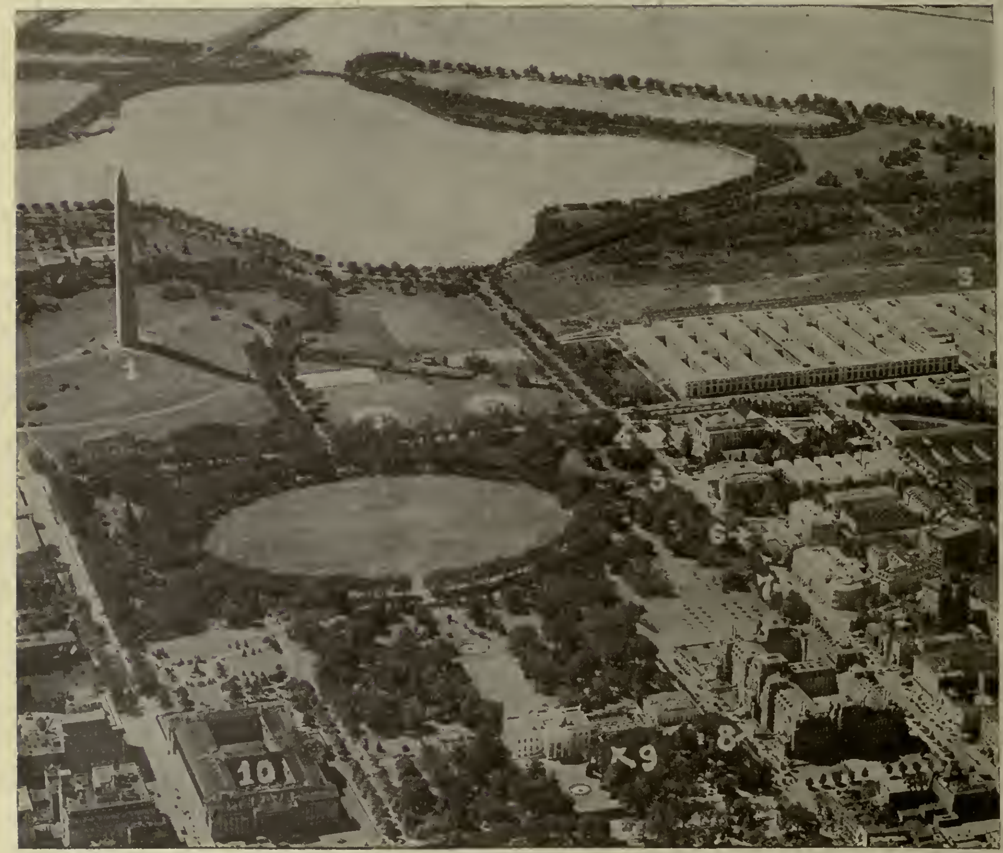
was largely in the hope of settling this point—an effort to see the city with the eyes of a city planner.

Years ago Victor Hugo made two suggestions for the visitor to a strange town: one was, to arrive at night, to gain the city's general form and characteristics silhouetted in the darkness; the other was, to ascend the loftiest tower, to grasp the place as a whole. Both of these are suggestive ideas in their adaptation to aerial use, and they show that the great Frenchman would have appreciated the use of the aeroplane in this regard.

A view of a city from above gives to the city planner its appearance as a whole. Some men have the rare gift of visualization and can construct the picture from a knowledge of its parts. The successful city planner must accomplish this by some means or other, because in the broad sense city planning disregards concentration on details and concerns itself primarily with the formation of the complete entity. The aeroplane does not give that confusion of detail one is so apt to get on the ground; the general plan stands sharply out. Maps and drawings cannot give just this result, because they cannot adequately differentiate the old buildings from the new, or, indeed, show anything except in a conventional and mechanical manner.

When a city-planning scheme is decided upon, it is rare that there are suitable plans or maps to guide one. Plans, as a rule, are littered with streets projected, subdivisions proposed, buildings and improvements not existing on the ground. Everything that the map shows has to be verified before planning work can begin. Aerial photography avoids this by the production of a pictorial survey accurate to the very minute the picture was taken. The city planner making a flight over a city can correct his maps in the air, mark the limits of the built-up area, etc., and altogether form a fairly good estimate of the correctness of the maps.

From the air, the value of space, fresh air and light are realized much more than on the ground, where one is too near the picture to comprehend it properly. And, again, parks, open spaces and trees are seen as distinguishing landmarks. Build-



Courtesy of the Air Service, U. S. Army, and the Pan American Bulletin

AS THE AVIATOR SEES WASHINGTON

The northwestern part of the capital, showing many familiar structures: 1, Washington Monument; 2, Navy Annex; 3, Munitions Building; 4, Pan American Building; 5, Continental Memorial Hall; 6, Red Cross Building; 7, Corcoran Art Gallery; 8, State, War, and Navy Building; 9, White House; 10, Treasury

ings seen in bulk suggest questions at once—open space? residences? adequate roads? factory locations? and so on. One strives to reconcile all these features in the scheme of things. No amount of map study could place them in the same relationship one with the other and with the city as a whole. There would be fewer opponents of city planning, could they see the average city as it actually is, from the cockpit of an aeroplane.

Residential and Industrial Locations

Aerial observations have very special spheres of usefulness in connection with the residential and industrial study of a city. Dealing first with a city's central area, it is possible to analyze the modification and development of existing groups of buildings and discover the influence on their surroundings. For instance, intensive building, either in bulk or in height, is graphically portrayed, and the advantages of limitation or zoning can be studied with a degree of accuracy not otherwise possible, because a whole area can be seen at once.

In connection with residential location there is the opportunity to see the environs of a city in such rapid succession that their relative values for housing are easily appreciated. At the same time, the distances from the industrial area, geographical obstacles to transportation, etc., can be taken into account. With all these things in mind, attention can be given to the question of open reservations around a city,—park, afforestation, or agricultural belt,—and these will again be determined to some extent by the nature of the land and the preservation of any distinct natural features.

Industrial location, dictated largely by railroads, rivers, harbors and topographical elements, should be considered with a tentative plan for improvement roughly in mind. From the air it is possible to test the practicability of a plan for industrial or railroad revision, making such alterations as seem necessary, and perhaps recasting the entire scheme.

At Green Bay, Wis., there are large areas of marsh land in the vicinity of the city. Any adequate observation of these from the ground is impossible, because they are not easily accessible. It might be a practicable scheme to reclaim them for use either as industrial or as residential districts, and aerial observation is distinctly helpful in devising a plan which would fit them into the mosaic of the city in a logical and beneficial way. In Europe individual industrial concerns are already using the aeroplane in the consideration of available sites for manufacturing purposes, and it cannot be long before railroads will also make use of it in designing track extensions, terminals, etc.

Altogether, it is obvious that aerial surveying covers a very wide field and its uses may be many and varied, and enough has been said to show that it comes to city planning as a very practical adjunct.

The Green Bay Flight

The flight at Green Bay, which has given the incentive for this article, was made by the author in a Curtiss biplane from the field of the Green Bay Aero Club, the largest landing-field in the Middle West. An elevation of 2,500 feet was reached and a speed of 90 miles per hour maintained. The flight was made over the city of Green Bay and the Fox and East Rivers. The photographs illustrating this article were made from this aeroplane on another trip, by Ray Irving Hannan, of Depere, Wis.

Zoning Ordinance for Portland, Ore., Defeated by a Small Majority

THE general zoning ordinance for Portland, Ore., passed by the City Council last March and later made subject to a referendum vote of the people by a group of selfish interests which opposed it, was defeated at the election on November 2, 1920, by the close vote of 30,150 for the measure to 30,651 against it. Confused with the many issues of a national campaign and on a ballot which contained 92 candidates for office, 11 state measures and 6 city charter amendments, there was small chance for a fair discussion of the issue, and it is certain that many voters did not understand it. This is the first zone ordinance in the United States to be referred to a vote of the people, and it is to be regretted that a clearer and more thorough campaign could not have been made for it.

As soon as the result became known, petitions began to come in to the City Planning Commission asking that the 149 precincts, covering about half in area of the city which voted favorably on the measure and including mostly the residential sections, should be allowed to come under its protection, letting the precincts which voted against it remain as unclassified districts until they petition to come under the protection of the zone ordinance. This proposal is now being given serious consideration. The newspapers and even some of the opponents of the measure have already begun to urge the drafting of a new zone ordinance, so that the careful educational work of the City Planning Commission during the last two years is not to be lost. In the meantime, Portland has the protection of a rather cumbersome clause in its building code, requiring that a special hearing before the City Council be held on every application for a permit for a new apartment house, industry, public garage and some thirty more kinds of business, with notification of all owners of buildings within 200 feet of the proposed new building.

Water-Supply Problems in Roumania

By George C. Whipple
Professor of Sanitary Engineering, Harvard University

A SANITARY engineer cannot travel through Europe without having the fact impressed upon him again and again that a public water-supply, ample, clean, and available in the houses, is the basis of sanitation. In Roumania one can see water-supplies in all their phases, from the most primitive wells of olden times, to modern, well-constructed public works.

For the most part rural conditions prevail. The people do not live on scattered farms, as in America, but in villages in which the houses are quite close together. It might be said that they live in a state of rural congestion. In these villages few houses have their own wells, water being obtained from one or more community wells. Many of these community wells are constructed with substantial well-curbs of masonry or concrete, usually round and covered with a roof. Water is drawn up in a bucket operated by a windlass, but well-sweeps and other devices are also used. The sanitary conditions are bad where the well-curbs are of logs, but in the main the opportunities for pollution of the water by surface wash are not great. The community wells are social centers, and young men and maidens congregate around them as in days gone by. One often sees crosses erected near the wells, indicating that the water has been blessed by the priest, and also tablets with inscriptions which call down blessings upon the head of him who dug the well.

During a recent visit to Roumania to investigate the typhus fever conditions for the League of Red Cross Societies, the writer had an opportunity to visit several of the public water-supplies, including those of Bucharest, and to talk with the engineer who has constructed many of the water-works systems of the country and who is familiar with all of them.

Sources of Roumanian Water-Supplies

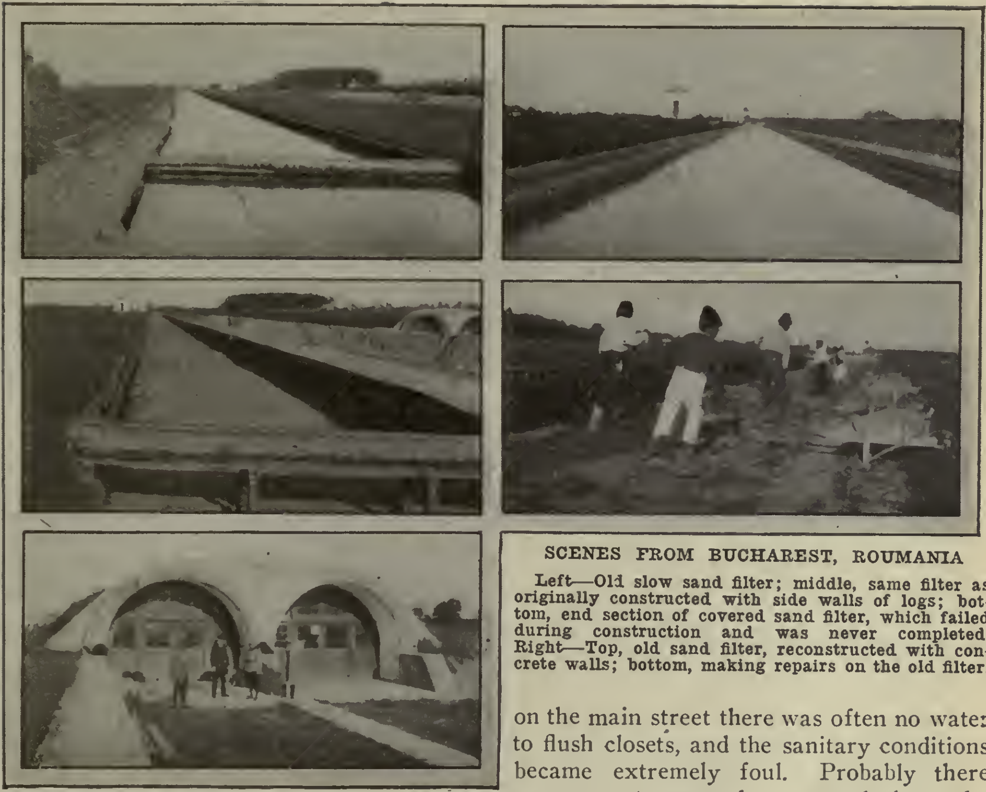
The Carpathian Mountains form a semicircle, convex to the south, in southeastern Europe. Before the Great War they formed the western boundary of Roumania, which extended on the north side of the Danube from the mountains to the sea. Since the Treaty of Versailles, Bessarabia has been annexed on the north and Transylvania on the west. On the mountain slopes the rainfall is ample, amounting to an average of more than 30 inches annually, a third of which falls during the summer. The rainfall on the plains of the Danube is only about 15 inches. The Danube delta is low and swampy and furnishes a great breeding-place for mosquitoes. The region is accordingly very unhealthful. Coast water-supplies are difficult to obtain, on account of the brackish character of the water.

The cities and towns which lie along the easterly slopes of the mountains have found no difficulty in getting satisfactory supplies of ground water. There are about twenty such supplies. A few places in this region have what may be called mountain supplies, taken from stored surface waters. Jassy, the ancient capital and the temporary capital during the war, has a mountain supply obtained from an infiltration gallery. The cities which are situated on or near the Danube use the river as a source of supply, as, for example, Turn-Severin, Calafat, Turnu-Magurele, Giurgiu, Oltenita, Braila, and Galatz. Danube water is also used by the coast cities of Constantza, the port of Bucharest, and Sulina at the mouth of the Danube. These supplies are filtered, and before the war several of the plants were equipped with apparatus for disinfecting the water with ozone.

Many of the cities and large towns on the plains have no public water-supplies. There are about thirty such places which have populations exceeding 2,500, and of these, ten have populations greater than 10,000.

In Bucharest

Bucharest, the capital of Roumania, is located on the plains fifty miles from the Danube and nearly a hundred miles from the mountains. It is south of the oil region and has grown rapidly since the oil industries began to develop. Before the war it had a population of about 350,000, but now it is nearer 700,000. In some respects it



SCENES FROM BUCHAREST, ROUMANIA

Left—Old slow sand filter; middle, same filter as originally constructed with side walls of logs; bottom, end section of covered sand filter, which failed during construction and was never completed. Right—Top, old sand filter, reconstructed with concrete walls; bottom, making repairs on the old filter.

resembles one of our rapidly growing western cities which has expanded in a random way without a well-defined plan. There are some fine boulevards and a number of splendid public buildings, but large churches are conspicuous for their absence. The houses are two, three, or four stories high. Stucco is a common building material. Many of the streets and sidewalks are narrow and crowded with a cosmopolitan population. The city did not suffer greatly during the enemy occupation, but at present it has a neglected and dilapidated appearance. It is distinctly below par, but recovering. It is a commercial and political center, not an industrial center.

Bucharest has three sources of supply, a filtered river water, and two well water-supplies of about equal capacity. The total consumption was stated to be about 25 million gallons a day, but this figure probably referred to the maximum rate of consumption rather than to the average. In May, 1920, there was a decided shortage of water. Each day the pressure fell so low that many houses failed to get water for hours at a time. Even in the large hotels on the main street there was often no water to flush closets, and the sanitary conditions became extremely foul. Probably there was a great waste of water, as leaks at the curb were seen in many places.

The most interesting of the three sources of supply was the old filter, built in 1883 by the Swiss engineering firm of Burkley-Zeigler and Kulman. The supply is taken from the Damovita River. There are four settling basins, 1,000 meters long, 30 meters wide, and 4 to 5 meters deep. The raw water is turbid, and even the settled water has a turbidity of about 40. There are four slow sand filters, each 500 meters long and 10 meters wide. They were constructed with side walls of logs, and two of them are in a bad state of repair. Two others were reconstructed a few years ago and now have concrete walls. The total area is 20,000 square meters, and the maximum capacity is perhaps 10 million gallons a day. In May, 1920, one filter was out of commission and the other filters were partially clogged. The output probably did not exceed 5 million gallons a day. The rate control is by hand, and the sand is cleaned in the old-fashioned way, by scraping, hauling in barrows and washing with a hose. A few years ago a contract was let for a new covered filter parallel to the old ones.

It was partially built when part of the roof fell. The contractor failed, and abandoned the contract, and the unfinished wreck lies beside the old filters.

The old plant, in spite of its shortcomings, continues to turn out water which is probably safe—thanks to the low rate used, the simplicity of the plant, and the attention given to it by the engineer who has managed it since it was first built. The water has a hardness of 40 parts per million. The hardness of the ground water-supplies is about 120 parts per million.

The first of the two ground water-supplies was constructed in 1900, the second in 1908. The city has already considered the problem of an additional supply, but no action has been taken. Two ideas have been advanced: one that enough water can be secured from the ground by driving additional wells; the other that a supply from the mountains will be required. If the city continues to grow, as seems likely, a mountain supply will probably have to be obtained.

In Giurgiu and Constantza

The city of Giurgiu on the Danube was one of the places devastated by the Bulgarians. The greater part of the place is in ruins. The water-supply, however, was not destroyed. It consists of a small, covered slow sand filter and pumping station. The filter is ridiculously small for the service, and this type of filter is inappropriate for a water so turbid as that of the Danube. The engineers who designed the plant must have been more influenced by Straus's Beautiful Blue Danube Waltz than by turbidity observations. In May, 1920, the filters were out of commission and dirty water was being pumped to the city. Similar conditions are said to exist in the other cities which use the Danube water.

At Constantza the water-supply conditions were very bad. Two pumps had been destroyed by the enemy and another had given out. The city was without public supply, and water was being peddled through the streets. Other cities were in a similar plight, though few were as badly off as Constantza.

"Out of repair" is the present order of the day in Roumania. Lack of facilities for making even minor repairs results in lack of service. This condition is even more conspicuous in transportation than in water-works.. The people cannot afford to improve their transportation equipment, because the financial conditions are so bad; they cannot improve their financial conditions without marketing their oil, salt, lumber, and crops; and they cannot market their products without transportation. It is indeed a "vicious circle."

Lack of adequate water-supply systems resulting partly from war conditions, but also from the natural neglect so common in eastern Europe, lays the country open to the menace of cholera and other water-borne diseases. In the past, cholera has not been prevalent in Roumania, however, although the typhoid fever rates have been quite high in many places.

Winter Storage to Expedite Spring Road Work

If road-building material is transported and stored at the point of consumption during the fall, winter and early spring months, the construction of highways in the 1921 season will be greatly facilitated. Open-top cars are more available during these months than when coal and harvest movements begin. Contractors having materials on hand when their season opens next spring, will go through production without facing expensive delays incident to the railroad congestion and car shortage.

Municipal and county officials must appreciate that road building is manufacturing, and any manufacturer will agree that he cannot maintain his business on a profitable basis unless he provides materials well in advance of his production schedule. Roads are among the most essential requirements of the people at the moment, in that they are a solution of the transportation problem. In some cases the law makes it possible for the state highway engineer to pay estimates on materials delivered. In other states, payment can be made only on finished work. It is to the mutual advantage of the public, the engineer and the contractor to take into account all means of expediting work and of readily financing road construction.

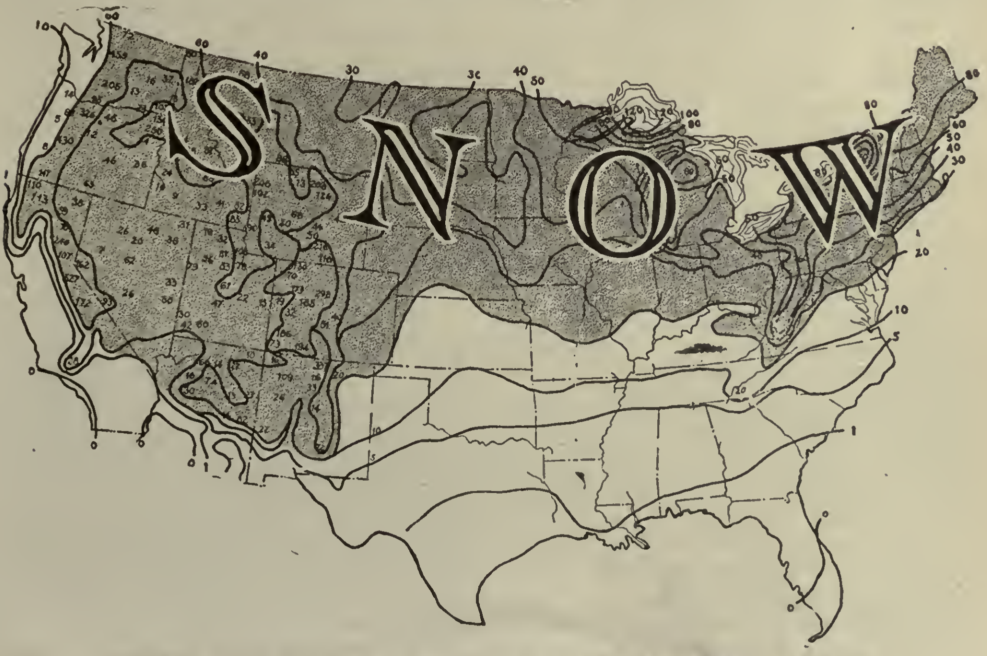
SNOW REMOVAL PLANS
OF STATES WITHIN THE SNOW BELT

IT is admitted that the railways are more effective to-day in handling freight transportation than they were one year ago, but the needs of the community in the transport of fuel, foodstuffs and general freight are even greater to-day than twelve months ago. Hence the importance of keeping highways open throughout the winter months so that motor trucks carrying their goodly portion of the commerce of the nation may continue without interruption, is greater than ever.

It is granted that the control of snow removal should be vested in state highway departments, but it is regrettable to learn that there are very few states within the snow belt which are empowered by state law to keep the main highways open. In most states this work is left entirely to the local unit—village, town or county.

Methods of Snow Removal

The development of snow removal has been remarkable. At first complete reliance was placed upon shovel gangs and horse-drawn V-shaped snow-plows. When the motor truck became a reliable unit, this was introduced and still remains exceedingly successful with pusher-plows. It is most efficient when it begins to remove the snow from the highway soon after the fall has commenced. In this manner, it constantly removes a reasonable small layer of snow to the side of the road and keeps the



INCHES OF SNOWFALL IN THE UNITED STATES—A 20-YEAR AVERAGE thoroughfare open. In cases of snow which has drifted, this type of snow removal instrument is not as effective. In some communities, such as Grand Forks, S. Dak., heavy tractors drawing huge V-shaped plows have been used for breaking open the roads after even very heavy snows. The Albany-Schenectady, N. Y., highway last winter was effectively opened by blade graders hauled by two small tractors.

The front cover illustration of this issue of The American City shows another very effective method of snow removal—by means of locomotive plows, mounted on heavy motor trucks. Possibly a still further improvement on this method would be the use of the same type of plow on 5-ton tractors. This type of plow can attack a very heavy drift and readily break through, pushing the snow to either side. While this would not be particularly effective in keeping a wide stretch of road clear in order to enable two lines of traffic to pass, still it would open a road which had become blocked by drifts, and hand labor could be readily resorted to to clear up the sides of the road after it had been opened to one line of traffic.

Snow-Drift Preventives

It is well appreciated that snow-drifts do not come by chance but are caused by the checking of the velocity of the wind by some obstruction. Thus, a hedge or a fence near the side of the road slows down the velocity of the wind, and a large bank of snow is deposited immediately on the leeward side. Wherever possible, hedges or fences should be located between 50 and 60 feet back from the road. Portable snow-fences are erected by the State Highway Department of Pennsylvania each winter along the main highways, and cause the formation of drifts well back from the road, leaving the traveled way itself reasonably clear. Stationary storm-fences may be made by spacing 6-inch boards 2 to 3 inches apart on posts set vertically in the ground to a height of about 6 feet above the surface. Where land is under cultivation, however, this method is not advisable and the portable fence should be resorted to.

Drainage

Thorough attention should be given to drainage in the winter-time. Drains and culverts should be kept open and free from obstructions at all times. This precautionary measure will reduce the present maintenance cost of improved highways. When the snow melts and passes away in the springtime it should be taken away from the road-bed and not allowed to clog and fill culverts, ditches and gullies. As soon as any road is cleared of snow, shovelers should be employed to cut openings to the side ditches along a road, so as to assist in the protection and drainage of the improved road surface.

What the States Are Doing

Following is a summary of the snow removal plans of the various states in the snow-belt, prepared from personal letters received from state highway commissioners, state highway engineers and maintenance engineers:

ARIZONA.—The Sate Highway Department did no snow removal work on its highways last winter. Most of the highways are not subject to winter snows, but wherever work is done, it is handled by the state on state highways and by counties on county roads. The most successful method of handling snow is to elevate the grade so that the wind blows the snow off the road in the level country, to build the roads on the southern slope in hilly country, and to cut out the timber which would shade the road from the sunshine. These methods have kept Arizona roads open with snowfalls under 2 feet in depth, with but very few exceptions.

CONNECTICUT.—The State Highway Department removes snow from the state highways, paying the cost from its maintenance fund, which is secured from the license fees for automobiles. During the past three or four years the Department has tackled the snow problem with greater or less success, having sufficient equipment to take care of ordinary snowfalls and using the regular forces employed by the Maintenance Department for this purpose. Last year approximately 1,000 miles of highway were maintained open throughout the winter.

COLORADO.—The State Highway Department and the County Commissioners use motor trucks, graders and drags for the removal of snow on main highways. There is no special difficulty encountered in this work. The storm of the latter part of last April was unusually heavy and kept the various county departments and the state highway forces busy for about ten days opening up the main roads. The Continental Divides are generally closed during December, January, February and March, and some part of April. It would be impracticable and a financial impossibility to keep these roads open during the winter season.

DELAWARE.—Snow-plows attached to motor trucks have been found adequate for the clearing of state highways, except at times of extreme snowfall and unusual storms. Delaware has very little snowfall, and what does pile up on the roads usually melts in a few days, seldom causing serious obstruction to traffic.

IDAHO.—No special work is done, with the exception of the erection of a few snow-fences to keep light snows out of the heavy cuts. The Maintenance Department is handicapped by lack of sufficient funds to carry on the work, as its only source of income is from motor vehicle fees. It is hoped that the next Legislature, which meets in January, 1921, will provide an appropriation in keeping with the importance of snow-removal work.

ILLINOIS.—Such snow removal as has been accomplished in the past has been through the efforts of local highway commissioners. When the road system under construction has progressed sufficiently to form continuous sections it will be necessary for the State Department of Public Works and Highways to make special provisions for keeping these roads open for travel during the winter.

INDIANA.—Inasmuch as the Indiana State Highway Commission has been in operation only since last May, it has not been able to organize sufficiently to handle any snow-removal problems during the coming winter months. If any work of this type has been done in the past it has been in the charge of the county authorities.

IOWA.—No definite plans have been made for handling snow removal in Iowa, except that a campaign has been maintained turoughout the summer to have weeds and brush cut along the highways as a snow-drift prevention measure.

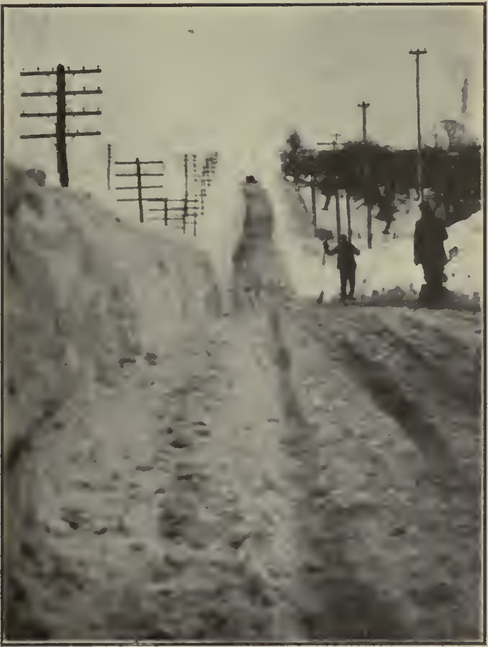
KANSAS.—Climatic conditions in Kansas are such that little difficulty is experienced with snow. There has never been sufficient demand for systematic handling of the matter, but if occasion should arise, the counties of the state are well prepared to handle it from their regular road funds.

KENTUCKY.—The Department of State Roads and Highways has never experienced any difficulties from highways blocked with snow. It is very seldom that the snowfall in this region is heavy enough to interfere with highway transportation.

MAINE.—There is no legislation requiring roads to be kept open for motor transportation during the winter months, and no general attempt has been made to do this. There are usually from 100 to 120 days when the ground is covered with snow in varying depths from 1 to 5 feet, and in the northern part of the state snow gets as deep as 6 or 7 feet and lasts 30 to 60 days longer than stated above, which makes the use of motors in the winter impracticable.

Paul D. Sargent, Chief Engineer, State Highway Commission, believes it will be a long time before any attempt will be made to keep the roads of Maine generally open for motor traffic during the winter. It is necessary to do more or less snow-breaking for horse-drawn traffic. Last winter was an exceptionally bad one, one of the small towns of the state having spent $1,000 for snow-breaking during the winter, while its total appropriation for roads during the open season is only $800. This shows the burden of keeping the roads open for ordinary traffic. If roads were to be kept open for motor traffic it would probably necessitate an expenditure equal to or more than the expenditure for all improvements and maintenance work during the rest of the year, and since there is no permanent benefit accruing from this expenditure it would not be financially advisable. Mr. Sargent believes that such work would be detrimental to the general condition of the highways, because wherever the snow was cleaned off, the ground would freeze much deeper than elsewhere, which would mean that the roads would be longer drying out and settling in the spring than under conditions as they exist now.

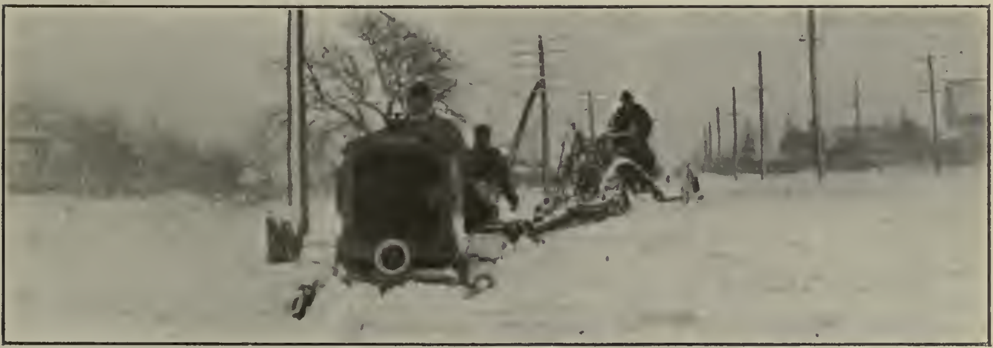
MASSACHUSETTS.—No work was done during the winter of 1919-1920, but the Legislature has made available $50,000 to be used during the winter of 1920-1921. A considerable portion of this fund will be necessary for the purchase of proper machinery, and it is proposed to coöperate with manufacturers and truck owners in the removal of snow on some of the main thoroughfares this winter.



A THROUGH ROAD MAINTAINED OPEN FOR TRAFFIC BY THE PENNSYLVANIA STATE HIGHWAY DEPARTMENT

MICHIGAN.—The State Highway Department, in coöperation with the counties of the state, maintains for traffic several of the more important trunk line highways, of which there are approximately 5,500 miles in Michigan. Only a comparatively small portion of this mileage, however, is maintained throughout the winter. With the exception of a few roads, the winter traffic is light, and all that is needed is to place the roads in sufficient shape so that they can be readily traveled by means of sleighs. For this reason most of the roads will not call for much of an expenditure for snow removal.

During the winter of 1919-20 a few of the Holt "Caterpillar" tractors acquired from the War Department were utilized for snow-removal purposes. Varying results were obtained. A few of the snow-plow attachments for trucks were used and were found to be fairly satisfactory where the snow did not exceed 12 or 15 inches in depth. Whenever attempts were made to remove snow much over this depth there was a tendency for the truck to move sideways, which was not productive of results. The old-style A-plows were in quite general use last winter and will be utilized this coming season, especially in the northern counties. Fairly good results have been had by using



OPENING THE ALBANY-SCHENECTADY, N. Y., ROAD WITH TWO LIGHT TRACTORS IN TANDEM HAULING A BLADE GRADER, FEBRUARY, 1920 regular road graders. The Department is investigating the possibility of rotary snow-plows, and possibly some such equipment will be tried out this coming winter.

For adequate winter maintenance, a crew must be ready to start out the day of the first fall of snow. Frank F. Rogers, State Highway Commissioner, states that it is his firm belief that snow must be taken care of as it falls rather than allowed to pile up before work is begun. There are times when hand shovel work must be resorted to to remove drifts; then the snow should be moved out as far as possible from the road grade.

MINNESOTA.—The rural highways of Minnesota were blocked by snow-drifts at various times and for various periods during the winter of 1919-20. The average on more important roads was about four times and approximately five and six days each time, the last being the worst and extending over approximately two weeks. This caused considerable hardship to the rural communities by closing the roads to the markets and in case of accident or sickness making it very difficult to get medical attention. Truck hauling was brought to a standstill at these times, and the delivery of supplies, such as cream and milk, was materially affected.

Because the state constitution prohibits the state from engaging directly in road work, the snow question will have to be handled by the counties until the constitution is amended, which it is hoped will take place in the very near future. Most of the counties depend entirely upon local endeavor to keep the roads open, and a number of them handle this matter in a most systematic manner and on the more important roads maintain a number of types of snow-plows, which were generally successful until the last storm. At the present time practically none of the counties are adequately prepared to keep any of the roads open under very severe conditions, but will be able to do so if the coming winter is a light one.

Special effort is being made to properly equip and keep the roads from Two Harbors to Grand Marais open at all times, because there are no railroads in this part of the state and it is impossible to reach any portion of Cook County except by road. Experiences during the past winter would indicate that up to the present time the most effective equipment for the average county is a V-shaped snow-plow with legs approximately 24 feet long and spread about 16 feet, pulled by horses. Very effective work was done in some of the counties by using large snow-plows pushed by trucks. A number of other counties used "Caterpillar" tractors, pulling large blade graders. It is evident, however, that equipment for handling snow is still in the experimental stage, and it is the intention of the Minnesota Highway Department to carry on considerable work this coming winter to determine the best mechanical means of handling snow. Last winter this department made a survey of all serious snow-drifts on the main roads. This will be done each winter hereafter, and it is hoped that the information thus secured will prove of great value in planning prevention measures, as well as in planning removal. The information secured in each case gives the apparent cause of the drift and the probable remedy. Experience indicates that it is not practical to open roads by hand shoveling, which is very expensive, and because the snow is piled up along the roadside, the next storm leaves a worse condition than before. With ordinary snow-plows the same difficulty is met, but the market as yet has nothing to offer which gives much promise of solving the snow question, except one or two machines, which appear to be along the right principles. According to the Maintenance Engineer of the Minnesota Highway Department, some mechanical means of throwing the snow away from the road to a considerable distance must be developed.

MISSOURI.—The State Highway Department has no funds for maintenance, and as the removal of snow is considered as maintenance work, no plans have been made for the coming season. A certain amount of money is allowed each year per mile for dragging a certain amount of inter-county-seat mileage, and if the commissioners of the different counties that have this work in charge are so inclined they can use part of this money for that work, but the laying out of the work is left entirely to these commissioners.

MONTANA.—The State Highway Commission will undertake no snow-removal work during the coming winter. Some Montana counties will remove snow from their principal highways, but it is not known just how extensively.

NEBRASKA.—Interesting comparisons of work in Nebraska are given by George E. Johnson, State Engineer, Department of Public Works. The data following cover Division No. 1 only, which comprises a total of 20 counties. As the maintenance work for snow removal began the first of April, the reports show that snow was removed from the highways in 1920 during that month only. The patrol maintenance system during 1921, however, will completely care for this work. The main roads will be kept open this year by highway patrolmen, as they are well equipped for the work. It is most probable that a drag pulled by a truck or a team will be used. Last winter several counties used with considerable success blade graders pulled by trucks.

The relative costs are incomplete, because the work was done only one month. Reports from the First Division show that for April there was a total expenditure of $2,344.25, of which $1,499.77 was spent for snow removal by teams in the 49 different patrol sections. The sum of $605.74 was spent for snow removal by trucks in 21 different patrol sections, and $238.74 was spent for snow removal by tractors in 9 different patrol sections.

NEVADA.—During last winter it was necessary to resort to snow removal in only a very few instances. In one instance when it was found necessary to open the road across the summit, 2-ton motor trucks and a heavy grader were used. In opening a road in the spring for traffic, sand was sprinkled on the snow. This sand, being baked in the warm spring sun, would settle down into the snow, permitting it to be easily removed with shovels, the sides standing practically vertical. As there was plenty of native sand along the road, this method proved very economical.

NEW HAMPSHIRE.—There are no provisions in the New Hampshire statutes for highway laws for snow removal. The towns are charged with the maintenance of the roads during the winter months, and the demands for automobile traffic have not been sufficient to warrant any expenditure along this line.

NEW JERSEY.—During the winter of 1919-20 the State Highway Department removed snow from those portions of the state highway routes which had been taken over by the State Highway Commission. Plans are not complete as yet for the coming winter, because of the change in administration of this department.

NEW MEXICO.—This state has practically no problems covering snow removal, because practically all routes are open the year round except a few of the mountain passes. Where it is necessary to remove snow, ordinary means, such as a road drag, horse-drawn snow-plow or a regular grader machine are used.

NEW YORK.—The state laws have not provided for any systematic treatment of the snow problem by the State Highway Commission. The present law leaves the matter entirely to each town, the town board being vested with the authority to raise such funds as it may deem advisable for the purpose. In the western, central and northern portions of the state very little attempt has been made to keep the improved highways open for motor vehicle traffic, as the expense thereof when borne by the town alone would be prohibitive. In the southeastern portion, where are located many towns, with a large percentage of improved mileage and with a light snowfall and frequent thaws, the main improved highways have been kept open at town expense, which, under the physical conditions mentioned, is comparatively light. It is expected that the state will take over this work when the traffic demands upon the highways warrant a revision of methods.

NORTH DAKOTA.—It is probable that the State Highway Commission will not be able to do any effective work in snow-drift prevention or snow removal because of limited organization and lack of funds. Experimentation plans are being made for fencing some of the cuts most subject to blockade by drifts, and a type of snow-plow and pusher is being designed for use with state motor trucks of the four-wheel traction type.

OHIO.—Under the ruling of the Attorney-General of Ohio, the State Highway Department is not permitted to spend any state highway funds to remove snow from the public highways or to prevent drifting of highways. Last winter, however, several thousand dollars were expended between the cities of Akron and Cleveland where traffic became blocked entirely. It is expected that the Department will erect some two miles of snow-fence this coming winter along the route between the above-named cities. Ohio laws give township officials the authority to remove snow from all roads of their township, and until some action is taken by the Legislature it will be impossible for the state to make any plans for the future.

OREGON.—Since the snowfall is usually very light on the west Pacific coast in Oregon there is not much difficulty with snow removal, the problem being chiefly rain and mud. On the high-altitude roads crossing the Cascade Range, however, snow usually blocks the roads and no attempt is made to open them up, because of the comparatively light traffic which would take advantage of it. On the Pacific Highway, however, over the Siskiyou Mountains, at an altitude of over 4,000 feet, the Commission intends to keep the roadway open by means of a heavy tractor and snow-plow.

PENNSYLVANIA.—Early in October last year the State Highway Department issued instructions to the district engineer to distribute snow-removal equipment, which consists of motor trucks equipped with snow-plows, motor trucks for hauling V-shaped plows, over 200 road machines and road drags for use on the main improved highways. These roads comprise the National Pike from the Ohio state line through Washington and Uniontown to the Maryland state line, the Lincoln Highway from the Ohio state line through Beaver Falls, Pittsburgh and Philadelphia to Trenton, the highway from Chambersburg to Harrisburg, Reading, Allentown and Easton, and from Reading to Philadelphia. Owing to the freight congestion, the Department deemed that this would relieve the railroads, and from traffic censuses which were obtained from time to time there was no question but that the roads were of inestimable benefit. Some sections of the Lincoln Highway pass through thinly populated mountainous sections where it is difficult to obtain labor, and on occasions this labor must be hauled from 8 to 10 miles for snow-removal work. Snow-fences are erected upon some sections where past experience has shown that the roads are most liable to drifts, and the forces are instructed that as soon as the snow begins to melt they are either to clear the hard surface entirely of the snow or to close the ruts by dragging. The detriment to a highway, especially to a bituminous surface treated macadam, of having traffic run in these ruts can be readily realized.

Plans for the present winter are practically the same as they were last year, with the exception that as fast as the highway system now being constructed is connected up and necessity is shown for keeping the roads open for winter traffic, this work will be added to the program. Instructions to engineers are that as soon as the snow has reached the depth of 3 inches they are to start snow-plows without further notice from anyone, and to clear the full width of the road, as past experience has shown that if this is not done succeeding storms will make it very difficult to keep a sufficient width for easy passing, with the consequent increase of hand labor.

RHODE ISLAND.—The state highway law requires that local authorities remove snow and ice from state roads so that they shall be passable. There are no county road organizations in Rhode Island, and therefore the responsibility for snow removal on both state and local highways rests upon township and municipal officials. The township authorities have in the past done very little toward keeping state roads open for travel during the winter months. As a matter of fact, winter storms which impede travel seriously for long periods are rather rare in Rhode Island, except in the northern and northwestern sections. During last winter, however, several heavy storms at short intervals effectually blockaded all the highways. A great deal of discomfort and not a little real hardship resulted. A number of the manufacturing plants more or less remotely situated were forced to shut down their operations because of inability to secure fuel or raw materials. Local stocks of foodstuffs in places were diminished to such an extent that a famine was threatened. Approximately ten days after travel had become impossible because of snow the General Assembly, which was then in session, passed an emergency appropriation for the purpose of opening state roads for traffic. It was provided that the funds available for this emergency appropriation should be spent by the State Highway Department. The Department was not equipped for snow removal, since the law placed no responsibility for that work. The snow, furthermore, fell in the form of sleet, which later froze hard, so that when the appropriation for snow removal was available it was a question largely of ice removal rather than snow removal. The Department was able to secure several snow-plows designed to be attached to motor trucks, but this equipment was found to be useless in view of the fact that the snow had solidified. The snow could have been removed very readily by the snow-plows soon after it fell, but later only the pick and shovel were efficacious. The work which was done made possible the resumption of traffic within a reasonable time, but the results were not gratifying.

The appropriation which was secured for snow removal was made available for expenditure this year only to January 1, 1921. At the beginning of the new year, therefore, the State Highway Department will have nothing to do with snow removal. A considerable number of trucks have been received from the Federal Government under the provisions of the Federal Aid Road Act as amended, and a number of snow-plows suitable for attaching to the trucks have been secured. The Department, however, has no authority to proceed with snow removal after December 31, 1920. It is seldom that there is much trouble in Rhode Island from snow before January 1. The Department favors the enactment of legislation permitting the keeping of state roads open during the winter months at

5-TON HOLT TRACTOR HAULING "V" PLOW TO OPEN ROADS IN GRAND RAPIDS, N. DAK.

the expense of the state and is endeavoring to secure such a law.

UTAH.—Ordinarily the snowfall in Utah is comparatively light, so that no considerable preparations have been made for snow removal.

VERMONT.—Under the laws of the state there are no funds available for the State Highway Commissioners to use in the removal of snow from highways, and for this reason the Department is taking no part in the work and has no plans for the future in connection with snow removal. The question of keeping the highways in proper condition for travel during the winter is left to the officials in the several towns, villages and cities.

WASHINGTON.—The only snow removal carried on in this state last year was on the Sunset Highway in the Cascade Mountains. This work was done under the direction of the county engineers of King and Kittitas Counties entirely out of the jurisdiction of the State Highway Commissioner.

WISCONSIN.—There is no law that authorizes the State Highway Department to keep roads free from snow during the winter months. There is, however, a law that gives the county boards the authority to say that any particular road in their county may be kept open during the winter months and that funds may be provided to defray the expense. Several counties during the winter of 1919-20 attempted to keep certain roads free from snow. Heavy motor truck equipment with the most modern snow-plows was used in connection with horse-drawn blade graders and other equipment. In the majority of counties the problem was not difficult until about the middle of January, when frequent snowfalls combined with high winds drifted the snow to such an extent that the motor trucks and snow-plows were practically of no use and the old-time methods of hand shovel work had to be resorted to. The Department has seen no snow-plow that can operate in Wisconsin so efficiently as to assure the public an all-winter road without resorting to considerable hand labor.

The Department is convinced that the time is coming when many of the main lines of travel should be kept free from snow during the winter months and that motor trucks and snow-plows during an ordinary winter will keep them open at a reasonable cost; but, on the other hand, it is just as sure that there will be years when the truck and snow-plow will at times be put out of business, for roads that have been entirely cleared of snow have been known to be again drifted several feet deep within fifteen minutes. Under these conditions it is impossible for any motor-driven equipment to keep the road open. The solution of the problem lies in preventing snow from drifting rather than in removing it after it has drifted. There is no doubt but what a motor truck and snow-plow will keep roads clear from snow at all times in Wisconsin, providing no drift occurs. Attention should, therefore, be directed to finding some method of preventing drifts, either by snow-fences or by planting hedges a proper distance back from the roadside and keeping them trimmed so as to serve the same purpose as a snow-fence and to be ornamental as well. J. T. Donaghey, Maintenance Engineer, Wisconsin Highway Commission, states that the Department does not feel pessimistic in regard to snow removal, but that he has hauled material and driven over highways in Wisconsin for 40 years and believes that at certain times and in certain places all the motor-driven equipment in the country would not keep a road passable; on the other hand, he believes that a method could be devised to stop the snow from drifting at such points, thereby making it easy to keep the roads open for motor vehicles at all times.

WYOMING.—Snow in this state almost invariably blows so far after it hits the ground that all blocking of roads by snow can be prevented by building the highways so that the wind will blow them clean. The State Highway Department believes it a good policy to study snow conditions on the road during the winter season and spend money the following summer in reconstructing the road so that the wind will handle the matter in the future.

The Health Officer's Time Valuable

There is a portion of one class of persons that is standing very firmly and obstinately in the way of the good that the health officers might accomplish. The ordinary city council will, without a moment's hesitation or a thought of extravagance, appoint a city marshal, a street commissioner, or some other officer with a salary of from $40 to $100 a month to guard the property and look after the peace and good conduct of the inhabitants or see that the streets and sidewalks are clean and passable. But should the health officer have the temerity to ask a reasonable compensation for his time and services, he is in too many instances promptly informed that the city cannot afford to pay a health officer and that he should be patriotic enough to do the work for a little or nothing. When this is the case, it is not surprising that many times the office is refused by those well prepared to attend to the work. Their time is valuable and they cannot afford to give it to the city. They also believe that protecting the lives and health of the men, women and children is as important and as much entitled to compensation as protecting and caring for the property and streets of the city.

Until city councils can be brought to appreciate this and act accordingly, health officers can scarcely be expected to devote the time and perform the labor likely to accomplish the most good, though many are doing it through pride and interest in the welfare of their home cities. Another hindrance is that councils of this class are almost, if not always, very loth to make appropriations for betterment in sanitary conditions.

Until officials come to recognize the fact that human life and health are of more value than everything else and that the only way to conserve them is by intelligent, scientific oversight and direction and combating the causes of disease and death and that men competent to do these things are entitled to reasonable pay, this hindrance does not seem likely to be removed.—*Public Health,* Michigan Department of Health.

THESE CONCRETE BRIDGES AND FLOOD WALLS ARE DESIGNED TO PREVENT A REPETITION OF THE FLOOD OF EASTER DAY, 1913

Concrete Bridges and Flood Walls Are Features of Flood Prevention Plan in Tiffin, Ohio

By James I. Oberlander

Formerly City Engineer, Tiffin, Ohio, and County Engineer, Seneca County, Ohio

ON account of the lack of any general plan for flood prevention and of restrictions as to buildings and flood walls, the channel of the Sandusky River, which runs through the central portion of Tiffin, Ohio, was encroached upon at various points until the maximum width was only 175 feet for about one block in the business portion of the city. The required width was 250 feet.

A full realization of this condition did not occur until the May floods of 1913, when flood damage approximated one million dollars, and a considerable portion of the city was under water and six steel bridges were washed away. Immediately following this event a general plan was formulated for widening and straightening the channel, constructing flood walls and replacing the bridges. By special act of the Ohio General Assembly, emergency bonds were voted, and because of the general situation the issue was approved by a large majority.

The New Plans and Construction

The county replaced the old steel bridges with five new concrete bridges of arch construction. This part of the plan, involving the expenditure of approximately $300,000, was financed by levies on the county at large.

In coöperation with the county, the city of Tiffin immediately started legislation providing for widening and straightening the channel. This involved many problems, as property had to be condemned, buildings moved, old walls torn down and a minimum width of 250 feet secured for the new channel. Construction was started on the bridges and flood walls in 1913, and with the exception of a few minor details this work was completed in 1917. About 2,600 lineal feet of concrete flood wall with a maximum height of 16 feet was constructed. The channel proper is in bed-rock and was not deepened. This work, including the cost of property condemned, approximated $265,000.

The River Improvement

Aside from the flood prevention features of this plan, it has materially benefited the general condition of the river through the city. The concrete flood walls serve to increase the discharge rate of the stream and form a definite channel line beyond which no filling or structures may encroach. Sanitary conditions have been greatly improved by the elimination of places for the collection of rubbish and refuse which naturally resulted from the former untidy conditions and from the lack of a clearly defined river bank line. The use of concrete throughout the entire plan greatly added to the general appearance of the city, and the permanency of the project is self-evident. With the completion of parkways along the banks, this channel, which at one time presented a very unattractive appearance, will have been converted into one of the beauty spots of the city.

The general plan for this work was prepared by the writer. E. G. Bradbury, of Columbus, Ohio, was retained in a consulting capacity, and Robert Lee, of Cleveland, Ohio, was consulting engineer in connection with the building of the bridges. The bridges and the channel work were constructed by Lewis Janes, contractor, Kansas, Ohio.

Children on the Streets

NEW YORK loses a number of children a day, and probably does not miss them. She may nevertheless object to assuming responsibility for the killing of even one child daily. This responsibility is unfortunately already hers. An average of twenty-three children a month have been killed on the New York streets since January 1, and during July alone thirty-nine have met their death on our thoroughfares. No one can deny the assertion of George Gordon Battle, of the Parks and Playgrounds Association, that this is an "aggravated number of child fatalities." No one can deny his statement that one of the principal causes for accidents is a lack of playgrounds in New York. Children cannot be killed on the streets unless they are on the streets to be killed. The more of them there are in the way of traffic and the longer they stay in the way of it, the higher is apt to be the percentage of fatalities. Obviously, the craving for play will drive them into the streets, and for extended periods, if there are no convenient play centers for their use.

This has been the condition in the past. It is the condition to-day, worse as the population grows larger. If the investigations attendant upon the housing shortage have revealed anything, they have shown that few blocks in New York have play room. Builders boast of occupying 70 per cent of the space allotted them with building alone. Some blocks have a non-structural area of but 10 per cent. Furthermore, apartment dwellers object to the courts being used for play. Courts are the supposedly quiet places of the block. As streets are noisy anyway, why not as much more noisy as children at play will make them? This is New York philosophy of living.

Children consequently are forced onto the streets. Probably those who might help Mr. Battle's organization do not realize what this means. They have not gone often or far on foot through the lower east or west side. They have not been actually impeded by children dashing between their legs, and have not seen games go on while motor trucks and carts get by as best they can. Surely they have never gone to bed at 9 P. M. to find sleep impossible because of children at play in the streets.

Yet this is the condition that is characteristic of much of New York. The most direct means of amelioration is through the establishment of play centers, and Mr. Battle's report of fifteen centers planned and but six opened on account of insufficient funds reveals a public apathy that is thoroughly shameful. But play centers such as can now be established in New York will not be enough. They will handle only a few children so long as they are far scattered, as at present, and edged in as unfavorable conditions permit. Every New York block should and eventually must have accommodations for play. It is a question of architecture, of town planning. True, New York cannot be at once remodeled. She can be built properly, however, as she is rebuilt. The present housing emergency offers an opportunity for a start in the right direction. A policy insisting upon playgrounds wherever possible can be adopted in connection with rebuilding or new building. Its acceptance is certainly a civic duty. Our attitude toward children is as unhealthy and as unmoral, and will prove as expensive ultimately as any we have. The time is ripe for a change leading us from one of the barbarities of our "civilization."

—An editorial in the New York *Globe*.

A City-wide Health Campaign

The Promotion, Organization and Results of the Campaign and Exhibit at Camden, N. J.

By O. V. Davis

THE great wave of health education which has been sweeping over the country in the last two years is slowly demonstrating its value, and an increasingly large number of people are becoming more interested in the subject. Because of this, Camden, N. J., planned and organized a city-wide health campaign. Every organization in the city expressed its willingness to coöperate, including all established social welfare organizations, clubs, churches, schools, and the city government. The estimated budget, which amounted to about $1,500, was raised to cover the general expenses of promotion, the rental of the armory and other necessary incidentals, the whole sum being underwritten by the Camden County Chapter of the American Red Cross. All other organizations assumed the expense of their individual undertakings and of a portion of the general program. The preliminary work occupied a period of four months.

THE THIRD REGIMENT ARMORY, CAMDEN, N. J., DURING THE HEALTH CAMPAIGN

The main objective was to "promote an educational program of good health for every man, woman, boy and girl in the city." In addition, each organization participating had its specific objectives, such as: better housing conditions and cleaner streets; organization of health clubs and home nursing; establishing more first aid instruction classes; definite program of sex education in schools, churches and industrial plants; establishing a municipal child observation bureau; compulsory registration of midwives; definite program in the interest of unmarried mothers; organization of safety council or bureau; organization of a public welfare bureau; more and better playground equipment.

The organizations coöperating in the Camden health campaign were: City Health Department, State Health Department, United States Public Health Service, Public Schools, Medical Association, Dental Association, Chamber of Commerce, Rotary Club, American Red Cross, Visiting Nurse Association, Tuberculosis Association, Associated Charities, Y. M. C. A., Y. W. C. A., Y. M. H. A., Y. W. H. A., Woman's Club, churches, newspapers, industrial plants, mercantile houses, American Legion, Boy Scouts, fraternal organizations, City Playground Association, Public Service Corporation.

The national health agencies coöperating were: American Social Science Association, Russell Sage Foundation, National

Safety Council, Child Health Organization, State and National Tuberculosis Associations, and Metropolitan Life Insurance Company.

The methods used in reaching the people were as follows:

Special Health Exhibit in Third Regiment Armory
Health and Safety Lectures in public schools, parochial schools, Sunday schools, industrial plants, Y. M. C. A., Y. W. C. A., Y. M. H. A. and Y. W. H. A.
Motion pictures and stereopticon slides with lectures
Distribution of health literature
Health posters exhibited in conspicuous places
Health sermons delivered by pastors of churches
Cho-Cho, health clown from Child Health Organization
Exhibits in store windows

The large exhibit in the Third Regiment Armory included fourteen sections by as many different organizations.

Each day during the week had a special subject, although the entire program was continuous. The week's program was:

Sunday, April 25—Health in Religion, the churches.
Monday, April 26—Opening of Campaign, all organizations combined.
Tuesday, April 27—Personal Health Day, Tuberculosis Association, Medical and Dental Societies, Y. M. C. A.
Wednesday, April 28—American Red Cross Day, Camden County Chapter, A. R. C.
Thursday, April 29—Sex Hygiene Day, Bureau of Sex Hygiene and Y. M. C. A.
Friday, April 30—Child Conservation Day, Bureau of Child Hygiene and Camden Chamber of Commerce.
Saturday, May 1—Public Safety Day, Public Service Corporation.

The original plan did not provide for the large centralized exhibit, which in itself caused the greatest expense of the entire program and was held in the largest hall available. While the comments regarding this feature were mostly favorable and expressing satisfaction, there was a question in the minds of the leaders as to whether the benefits derived through the exhibits were worth the effort and expenditure. It was agreed that the results gained justified this portion of the program, as much of the benefit would be indirect and probably not shown for some time afterward. Regardless of the value of the centralized exhibit, however, it was evident that there should be some kind of central attraction which would draw the interest of the entire city to the question of health.

The motion picture, stereopticon, stereomotorgraph and other similar mechanical devices were well demonstrated for their exceptional value in educating the general public. In these various ways the facts of scientific research are brought to the eye and understanding of those who otherwise would not receive such knowledge. The great "Gospel of Prevention" is thereby visualized for them, and as most people learn through the eye, this method probably proves to be the most effective.

While the poster and panel exhibits were very attractive and contained valuable information, there was no action, and therefore they did not hold the interest. It is probable that posters used by a good lecturer would be very effective.

The most effective methods used in the entire program were the illustrated lecture and the actual demonstration with lecture. Here we have the attraction, the attention held, the material presented and understood, and the visitor satisfied, also opportunity for questions and discussion.

Timely Fire Questions

Is the chimney free from cracks, loose brick and other defects, and is it clean?

Is any woodwork in direct contact with the chimney?

Are boilers or furnaces set on brick or concrete bases?

Is the floor under stoves protected by a stove board?

Are ceilings, partitions and walls within two feet of the stove, furnace or boiler protected with metal over asbestos?

Is the ceiling within a distance of one and one-half times the diameter, and the wall or partition within a distance of the diameter, of the smoke-pipe so protected?

Is there a ventilated double thimble and asbestos around the smoke-pipes in partitions?

Is any smoke-pipe running through an attic or other concealed space?

Is the smoke-pipe sound, well joined and wired, and properly fitted into the chimney, and is it clean?

Does the wall-paper come up against any smoke-pipe?

Are any flue holes stuffed up with rags or covered with wall-paper or wood?

Is your shingle roof moss-covered and defective so as to become readily ignited by chimney sparks?

Is the stove, boiler or furnace sound?

Is the woodwork around hot air registers and pipes protected?

Do you store ashes in wooden receptacles, on wood floors, or against walls, partitions or fences?

Is your boiler room clean and kept so?

Do you overheat the stove or furnace or leave drafts wide open?

Timely repairs and care along these lines may save you "dough" and woe.

—*Industrial Commission of Wisconsin.*

Complete Motorization — The Goal Attained

Syracuse, N. Y., Claims the Record for Complete Motorization of the Equipment of Its Various Departments

DURING the last few years the gradual displacement of horses by motors, for hauling equipment, has been carried on in the city of Syracuse, until the Fire and Police Departments, and now the Department of Public Works, have been fully equipped with motor-driven apparatus.

The latest addition to the city's motorized equipment consists of a fleet of three 5-ton Federal tractors and thirty Arcadia trailers, in use for the collection of ashes and refuse, for the Department of Public Works. After a series of tests and experiments covering the last twelve months, under the supervision of Commissioner R. B. Williams, Jr., and Deputy Commissioner Henry F. Goldacker, equipment costing over $250,000 has been purchased and put in operation, taking the place of 100 teams, most of them hired by the day, which were formerly used in the work of this Department. Second Deputy Commissioner Morris L. Jones has rendered valuable assistance in the study of methods and routes, having direct supervision of street cleaning, under the Commissioner.

The city has been divided, after careful study of distances and routes, into several districts, with one tractor and ten trailers allotted to a district, enabling the Department to make collections in all districts on each day of the week. The district gang is responsible for the collection in its own district only, and each Monday morning the work is started at a point farthest from its dump, making a constantly decreasing length of haul throughout the week.

This system, while it has been in operation only a short time, has already shown a great increase in efficiency over the old sys-

MOTOR TRUCKS EQUIPPED FOR THE COLLECTION OF WET GARBAGE

FEDERAL TRACTOR WITH LOADED TRAILERS

tem, and promises a still greater increase as the result of further experience in handling the fleet.

Other additions to the motor equipment in the last year include: a fleet of Ford one-ton pick-up trucks of 2 cubic yards capacity, for collecting the sweepings of "White Wings" in the streets, displacing 27 teams. Twenty-seven routes for teams have been cut down to 8 routes for auto pick-ups.

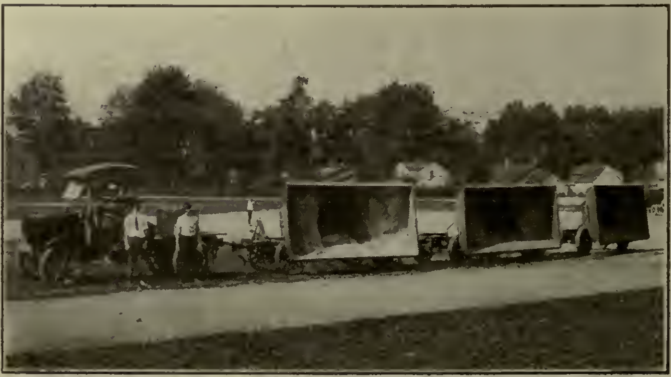
It was found that more time was consumed in drawing loaded wagons to the various dumps than was used in loading the wagons. Trucks in this work are checked out in the morning and in at night, and an account is kept of the number of loads drawn each day.

Three 5-ton dump body trucks for the hauling of stone and cinders, displacing twelve teams, have been added. All broken stone is drawn from quarries five or six miles from Syracuse. Each truck can deliver upon the city streets 50 tons of stone per day. Cinders are loaded by a portable machine loader, which can load one truck in seven minutes. The cinders are collected by the city each winter and stored for use upon the unimproved streets, for maintenance work during the summer.

The city has also purchased the following equipment: four 3½-ton steel-body garbage trucks, for the collection of wet garbage, displacing twelve teams; one 1½-ton emergency truck, for use in the repairing and cleaning of sewers, displacing two teams; one 2-ton Federal truck for use in repairing brick pavements, displacing two teams; three 1,200-gallon White motor flushers, for washing paved streets, where there are no car tracks, displacing nine teams, and working 16 hours per day, in two shifts of 8 hours each; one portable motor-driven loader for stone and cinders, displacing seven men; one 1-ton Ford platform truck, for general emergency use, displacing one team; one Cleveland tractor road-scraper, displacing two teams. The Department is planning to purchase next year at least two motor-driven vacuum street sweepers, which will be operated 16 hours a day and will displace more than 100 White Wings.

As the result of his experience, Commissioner Williams is a firm advocate of motorized equipment, and says:

> "Our experience has shown that the work of this Department, in a city as big as Syracuse, cannot be done promptly and efficiently if dependent upon horse-power. Teams which have to be hired by the day from outsiders cannot be depended upon. Motorized apparatus, capable of working all the year round in this climate and owned by the city, is the only solution. There is no more reason why the Department of Public Works should not be motorized than the Fire Department.



TRACTOR WITH TRAILERS DUMPED

Fuel Oil versus Steam in a Municipal Power Plant

Sioux Falls, S. Dak., Water and Electric Plant Keeps Pace with the Demands of Increased Population

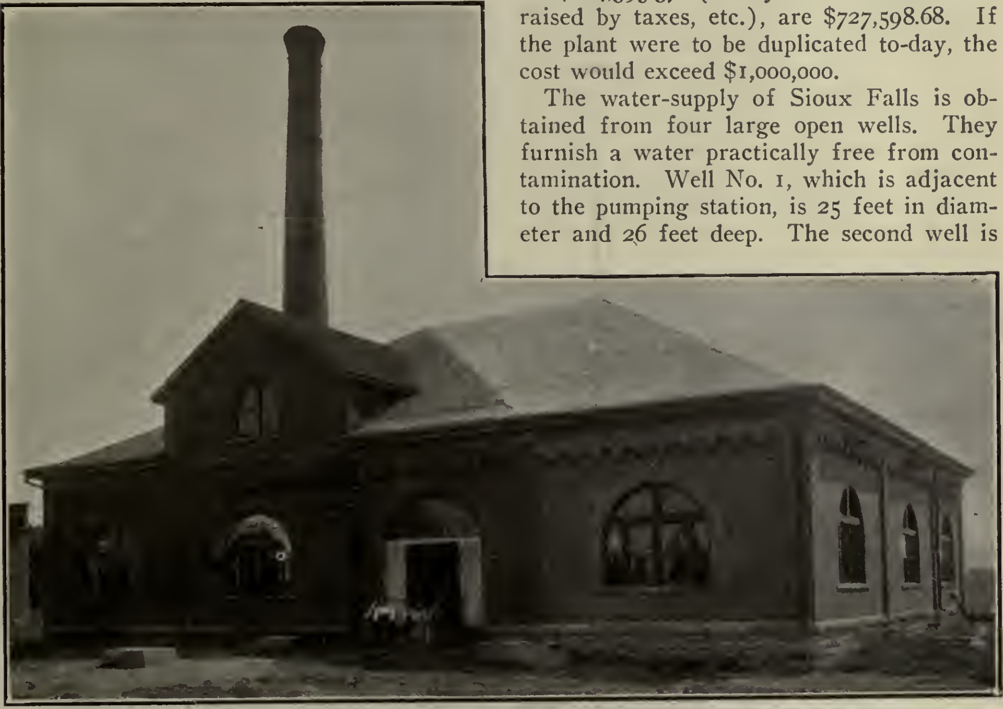
By John Mundt
Commissioner of Water, Sioux Falls, S. Dak.

IN the sixteen years that the water-works have been owned by the city of Sioux Falls, S. Dak., thousands of dollars have been saved by the taxpayers and consumers. This department has made extensive improvements from time to time to meet the increased demand of the steadily growing population, and there is no other department of the city government which shows a more healthy condition.

A bond issue of $210,000 was authorized by the voters in 1903, and in 1905 the municipal plant was furnishing the city with water. In 1911 it was deemed necessary to ask for another bond issue of $100,000 for improvement and increased capacity because of the large growth in demands upon the plant. In 1915 a third bond issue of $140,000 was authorized for the purchase of new oil engines, elevated tanks, reservoir and other improvements. Great economy was realized from the installation of the new oil engines, as the pumping cost was cut to about 50 per cent of the former cost. (See tables of comparison of pumping cost.)

The financial condition of the water-works is one of particular merit. The total indebtedness of this department is equal to the amount of the outstanding bonds, or $450,000. Besides the amount raised by bonds, the city has also appropriated from taxes, fines and licenses, $114,108.33, making a total investment of $564,108.33. The assets, figured at actual cost, less depreciation of $114,395.37 (nearly the exact amount raised by taxes, etc.), are $727,598.68. If the plant were to be duplicated to-day, the cost would exceed $1,000,000.

The water-supply of Sioux Falls is obtained from four large open wells. They furnish a water practically free from contamination. Well No. 1, which is adjacent to the pumping station, is 25 feet in diameter and 26 feet deep. The second well is



EXTERIOR OF WATER-WORKS POWER PLANT AND PUMPING STATION, SIOUX FALLS located about 1,600 feet from No. 1. The other two wells are within a radius of 2,000 feet and average 50 feet diameter by 40 feet deep. All the wells are equipped with motor-driven centrifugal pumps with a total rated capacity of about 5,000 gallons per minute. These pumps deliver the water to a reservoir at the pumping station. This reservoir is 116 feet square and 14 feet deep, is built of reinforced concrete and has a capacity of 1,200,000 gallons.

Two elevated tanks and one stand-pipe are located in various parts of the city. The steel stand-pipe is 115 feet high and of 275,000 gallons capacity. The third tank, of 350,000 gallons capacity, is located in the southern part of the city. The same elevation of the tops of the stand-pipe and elevated tanks was effected in the construction, affording a domestic pressure of about 72 pounds at the pumping station. The pressure may be increased for fire purposes, as was formerly done, though it has not been necessary to do so since the city purchased motor-driven pumping engines for fighting fires. The tanks and stand-pipe can be shut off from the mains by electrically operated, hydraulic valves controlled at the pumping station. Floats in the tanks are so arranged that when the tanks are full this is indicated at the pumping station by electric signals.

The power plant consists of two 160-h.p. Busch-Sulzer Brothers Diesel engines, driving two 1,600-gals. p.m. Aldrich triplex pumps and with two 135-kv.-amp. General Electric Company generators, mounted on the engine shafts. Before these were installed, the station equipment consisted of one 300-h.p. and two 200-h.p. vertical water-tube boilers; one vertical triple expansion pumping engine of 3,000,000 gallons daily capacity, with surface condenser, and one horizontal compound duplex pumping engine of 3,000,000 gallons daily capacity, equipped with a jet condenser.

An interesting excerpt from the report of the city's consulting engineer, Dabney H. Maury, of Chicago, when the additional equipment was contemplated, gives considerable light on the relative cost:

> "The additional capacity required may best be obtained either by adding one triple expansion pumping engine of, say, 3,500-gals.p.m. capacity, or two reciprocating pumps of 1,600-gals.p.m. each, driven by modern oil engines.
>
> "The steam pumping engines would cost, installed complete with pump-pit foundation and steam and water pipe connections, about $32,000, the two 37½-kw., steam-driven generating units about $2,000 each, or $4,000 for the two, and the enlargement of the coal bin about $2,000, making a first cost of $38,000 if steam pumping and generating machinery be purchased.
>
> "The cost of two oil engines each connected by Falk herring-bone gears to a 1,600-gals.p.m. horizontal duplex outside-packed pump, with friction clutch to cut-out pump when not needed, and belted to a 37½-kw. generator, thus allowing generator to be cut out when not required, all erected complete with pump pit, foundation, pipe connections and fuel oil tank of 1,500 gallons capacity, would be about $37,000. No enlargement to coal bin will be necessary if the bulk of the pumping is to be done by oil engines in the future."

The increase in all branches of this department may be appreciated from a comparison of figures in 1909, when the commission form of government first went into effect, with the figures at the present time. In 1909 the city owned 157 fire hydrants, as compared to 350 in 1919, and 28.42 miles of mains, as compared to 61 now, which does not include many small mains. The increased demand can easily be comprehended by a perusal of the following table:

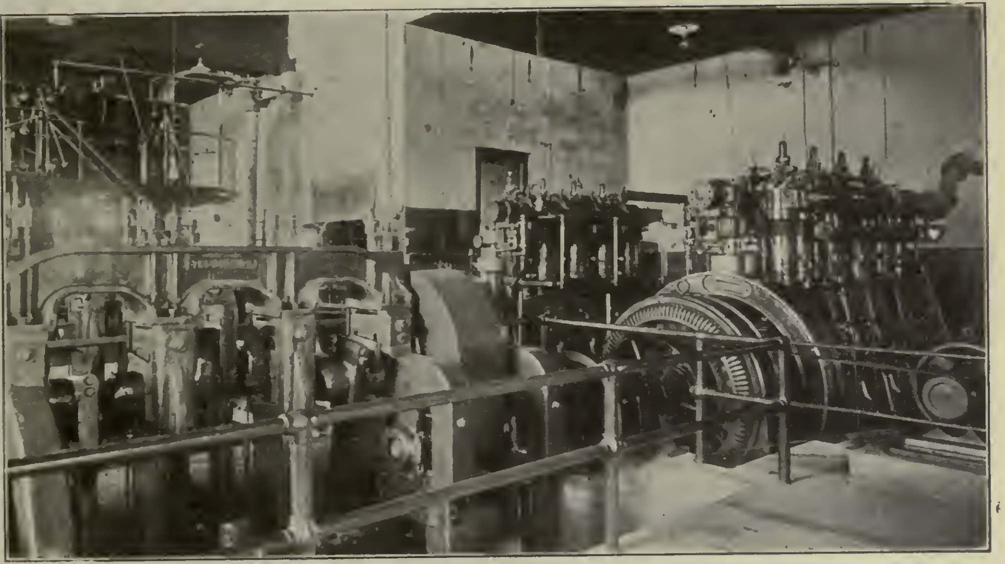
	Total Services	Active Services	Inactive	Metered
1909.........	1,985	1,785	200	175
1919.........	4,814	4,380	434	4,094

A YEARLY COMPARATIVE TABLE

Year	Pumpage, Gallons	Revenue	Operation	Interest	Depreciation	Total Cost	Profit
1913	457,402,585....	$53,809	$18,941	$15,500	$5,893	$40,339	$13,469
	Per M gallons.	.1176	.0414	.0339	.0129	.0882	.0294
1914	524,807,212....	58,661	21,285	15,500	5,738	42,522	16,137
	Per M gallons.	.1118	.0406	.0295	.0109	.0810	.6307
1915	579,593,325....	70,695	23,217	19,000	8,274	50,491	20,204
	Per M gallons.	.1220	.0401	.0328	.0143	.0872	.0348
1916	647,739,704....	84,463	22,530	22,500	14,329	59,360	25,103
	Per M gallons.	.1303	.0348	.0347	.0221	.0916	.0387
1917 1918	692,471,091 686,351,079 ..	183,611	55,708	45,000	31,944	132,653	50,957
	Per M gallons.	.1331	.0403	.0326	.0232	.0961	.0370
1919	834,317,671....	87,959	40,269	22,500	16,301	79,071	8,888
	Per M gallons.	.1055	.0483	.0270	.0195	.0948	.0107

Explanation of Table.—The interest on bonds was paid for by the city (and is included in the revenue) for water furnished for drinking fountains, swimming pools, street and sewer flushing, public buildings, parks, hydrants, etc., except during 1919, when the city made no appropriation to pay for the water furnished.

A liberal depreciation has been charged off during the last four years to cover obsolescence on one of the steam pumps.



INTERIOR OF SIOUX FALLS PLANT, SHOWING DIESEL ENGINES, GENERATORS AND PUMPS

Cost of Steam Operation

To arrive at the operation cost per million gallons, we have taken the three months of June, July and August of the three years 1913-14-15, during which time we pumped 465 millions and consumed 1,770,000 pounds of coal, which equals 3,806 pounds of coal per million at the present price of $10.50	$19.98
Estimated cost of lubricating oils, wiping cloths and repairs	.50
Cost of fuel, lubricants and repairs per million gallons	$20.48

Cost of Oil Operation

To arrive at the operation cost by the Diesel oil engines, Aldrich pumps and generators, we have taken the three years of 1917-18-19, during which time we pumped 2,189.6 million gallons and generated 1,252,310 kw. hr., or 570 kw. hr. per each million gallons, with the following consumption and cost at present prices:

278,192 gallons of fuel oil at 10½ cts. per gallon	$29,210.16
1,811 gallons of engine oil at $1.00 per gallon	1,811.00
722 gallons of compressor oil at 90 cts. per gallon	649.80
832 gallons of pump oil at 53 cts. per gallon	440.96
115 gallons of dynamo oil at 60 cts. per gallon	69.00
270 gallons of kerosene oil at 20 cts. per gallon	54.00
1,800 lbs. of wiping cloths at 20 cts. per lb.	360.00
Three years of repair cost	2,564.95
35.46 million gallons of cooling water at $16.50 per million	569.13
Total cost of fuel, lubricants and repairs for oil engines, including cost of electric current furnished for power and light	$35,729.00

Dividing cost of operation, $35,729.00, by 2,189.6 million gallons	$16.32
Cost of 570 kw. hr., being 35 per cent of power used	5.71
Cost of 1,000,000 gallons, being 65 per cent of power used	10.61
Gain in pumping with oil over steam per million	9.87

Before installing the Diesel engines and generators we purchased the electric power from the power company and paid them from 3½ to 4 cents per kw. hr.

If we allow the same rate for 570 kw. hr. at 3½ cts.	$ 19.95
Cost	5.71
Profit	14.24
Profit on water	9.87
Total gain	24.11
Of if we figured the 1,252,130 kw. hr. at 3½ cts.	43,830.85
Operation cost, three years	35,729.00
We would have a profit of	8,101.85
and pumpd the water for nothing.	

In addition, the use of coal would have required additional cost for the extra help necessary to handle it. It is but fair to the manufacturers to state that on account of certain unavoidable conditions the engines were allowed to be operated over their rated capacity for a considerable length of time, which was no doubt the main cause of the high repair cost, possibly also increased by some neglect. With proper care and engines operated at their capacity, we know the repair costs will be much less. A number of improvements are contemplated, such as an iron removal plant of 8,000,000 capacity, a new well, another elevated tank, several miles of main extensions, etc.

Transportation—the Keynote of Prosperity

A Transportation Committee Recommended for Chambers of Commerce

By F. W. Fenn

Secretary, National Motor Truck Committee, National Automobile Chamber of Commerce

IS the rural section surrounding your community producing to its full capacity the things which you require as food, or is it, through lack of adequate transportation facilities, shortage of labor or declining population, simply drifting along, furnishing a mere existence to those who operate the farms?

Have you a good point of contact with cities and towns lying adjacent to you? Are your lines of communication clear for the free flow of commerce to other communities, or are you having trouble through strikes or shortage of transportation equipment?

If your community is to continue to expand and grow, you must develop your transportation facilities, employing to the fullest extent those agencies which now exist. These agencies may be railways, waterways or highways. The town you live in may not have navigable waterways, but it undoubtedly enjoys some sort of rail transportation, either on a main line where the service may be good, or on a branch line where it probably is irregular.

It may be to your interest to use the highways entirely in the commercial intercourse with your neighboring towns, especially if the distance be within the range of from 50 to 60 miles and not more than 100 miles. In this case, the vehicle employed would be the motor truck. The highway motor truck route means an overnight delivery, a door-to-door service, a reduced cost for shipping less than car-lots short distances.

Increase of Urban Population

The most important activity of any communty is that of agriculture, and yet it is safe to say that, generally, it has the least of our attention. The census reports tell the alarming story of an ever-increasing flow of population from the rural to the urban districts of our country. In 1900 the national population was 75,994,575; in 1910, 91,972,266; while in 1920 it had increased to 105,683,108. The increase in the last decade has been 13,710,842. This increase is greater than any previous growth, with the exception of that during the decade immediately preceding it. The falling off was probably due to the temporary halting of immigration during the war, and to other losses through emigration from our own shores, casualties of the world war, etc. For the first time in the history of our country, urban population exceeds rural population.

Preliminary estimates give a population of 54,816,209, or a little over 51 per cent, living in incorporated communities of 2,500 inhabitants or more, and 50,866,899, or 48 per cent, in rural districts. An analysis of the growth of population from 1910 to 1920 shows that there has been an increase in urban population of 12,192,826, or 28.6 percent, while rural population has increased only 1,518,016, or 3.1 per cent.

When a manufacturer finds his production costs rising, he immediately looks around for new methods, usually of a mechanical nature, through which he hopes to readjust things. The farmer has been slower in the adoption of new methods than has the city man. He has seen his labor costs rise steadily from $15 and $20 to $60 and $75 a month, and he has paid greatly increased prices for everything he needs in the operation of his farm. The business man, both in rural and in urban activity, requires some form of transportation to make his products available for consumption. The city man can often choose his form of carrier—although not always to his advantage—water, rail or highway, but the farmer in most cases must rely entirely on the highway.

What a Transportation Committee Can Do

Every chamber of commerce throughout the land should have a transportation committee. The personnel of this committee should be drawn from local merchants, manufacturers and farmers, and should have at least one railroad man and a prominent motor truck owner or operator. The committee should also have a first-class traffic manager and a farm secretary. The duties of the committee would be to keep a record of railroad freight car movements, cars available for the needs of business, tonnage awaiting shipment, future tonnage, destination of goods, etc. Railroad officials should report, at frequent intervals, cars available on sidings and car movements, and merchants and manufacturers should make regular reports of the class, bulk and date of all shipments, in order that the traffic manager may arrange for proper transportation facilities.

In all parts of the country a vast tonnage is forwarded in less than car-load lots (l.c.l.) to neighboring towns and cities. Upon investigation, it would probably be found that it is cheaper to ship such goods by motor transport. It is certain that were motor transportation employed in handling this class of goods, the shipping cost would be lower and the transaction a door-to-door over-night delivery, whereas the rail line might require two or three days to accomplish the same service. It should be borne in mind that in shipping l.c.l. short distances, four to five handlings, cartage at both ends, and, in many cases, packing and boxing, are eliminated. These are items well worth considerable thought, for they must be included in the rail freight rate.

Every rural section should be made to produce, as much as possible, the requirements of all consuming communities. Every acre of land should be made to yield to the utmost those products for which it is best fitted, and the consuming public should not draw upon other farming sections for that class of product so long as its rural section can produce sufficient for their requirements.

QUICK SERVICE BY MOTOR TRUCK ELIMINATES WASTE OF CROPS

Waste of Foodstuffs Through Lack of Transportation

In many cases foodstuffs on which the farmer has expended much time and capital are allowed to rot away for the want of transportation. Motor transportation is often the only kind available, but it is not organized.

The greatest food crop ever raised in Berrien County, Michigan, valued at from $8,000,000 to $10,000,000, is rotting on the ground in spite of the fact that it is only four hours' distance from Chicago, one of the greatest consuming centers in the world.

Thousands of bushels of fine peaches are being fed to hogs or dumped on the ground to rot. It is a serious matter when we find peaches selling in the Chicago market for from $2.50 to $3.50 a bushel, while at Benton Harbor, a short distance away, farmers are glad to get 75 cents a bushel for them. The same condition exists in many communities.

Another fact well worth noting is that Milwaukee receives 80 per cent of its milk supply by motor transportation and enjoys the lowest retail rate of any city of its size in the country.

The St. Louis Chamber of Commerce employs a specialist who is constantly working among the farmers and county agents for the purpose of making agricultural production profitable. It would probably be to the advantage of all consuming communities to maintain a farm secretary in connection with its committee, whose duty would be to encourage greater production of farm products and inaugurate proper operation of motor transport lines between farm and city and create a ready market for these products at consuming centers. The committee, through its staff, should compile and determine rates which should be charged by motor truck operators, such rates to be made standard and based on the cost of operation, netting the operator a fair return and setting a minimum standard rate which the farmer and the city user of the transportation offered is to pay. At Cincinnati, motor truck terminals are clearing congestion and are releasing freight cars, effecting a saving of $1,000 a day to railroads and shippers.

It is well to remember that a properly functioning transportation committee will prove one of the best and most profitable steps ever undertaken by your chamber of commerce. It will help to eliminate present wasteful methods of distribution, cut down cost of handling, and make rural life and production enjoyable and profitable. Transportation, whether by rail or highway and motor, is the link which ties up your town with the outside world. It is the inlet and outlet for the products which you require for consumption and those which you have for sale. You cannot develop beyond your transportation resources. Facilities may be ample, but unless they are properly correlated they are wasted and your industrial fabric suffers.

The National Motor Truck Committee of the National Automobile Chamber of Commerce, 366 Madison Avenue, New York City, will gladly aid in the formation of a Transportation Committee in any Chamber and will work with it to effect successful results.

Planting Highway Trees

The California State Forestry Bureau is doing a good work in urging the planting of trees along the highways of the state. In the course of a few years, such policy, consistently carried out, would produce big dividends in beauty and usefulness. The Bureau has published a book of useful facts on street and highway tree planting that ought to be in the hands of tree-lovers.

If one were to take a survey of the failures and neglected opportunities along this line, many valuable lessons would be learned. It takes some expert knowledge of the subject to avoid the most frequent causes of a lack of satisfactory results. Not every kind of tree is suitable for highway purposes. First, there is the matter of appropriateness and beauty. Generally, it is no more difficult to grow a handsome tree than it is an ugly one. Sometimes they aim to serve as windbreaks and as screens to cut off undesirable views.

Some trees are inappropriate because of scraggly and spreading branches and mischievous roots that go far afield for water and send up sprouts to annoy the farmer. Some are too tall and brittle, and are sources of danger and dirt all the time. Others require too much personal attention in order to thrive and are therefore too expensive to keep up on a large scale.

For a useful as well as an ornamental tree, the walnut deserves careful attention. While it cannot be made an important part of state policy to try to raise any crop from such trees, it is no disadvantage to grow trees that do bear a crop, provided such trees are otherwise satisfactory. Walnut trees would produce nuts enough to pay the county for their up-keep, provided some system was applied to managing the business.

The Care of Municipal Trees

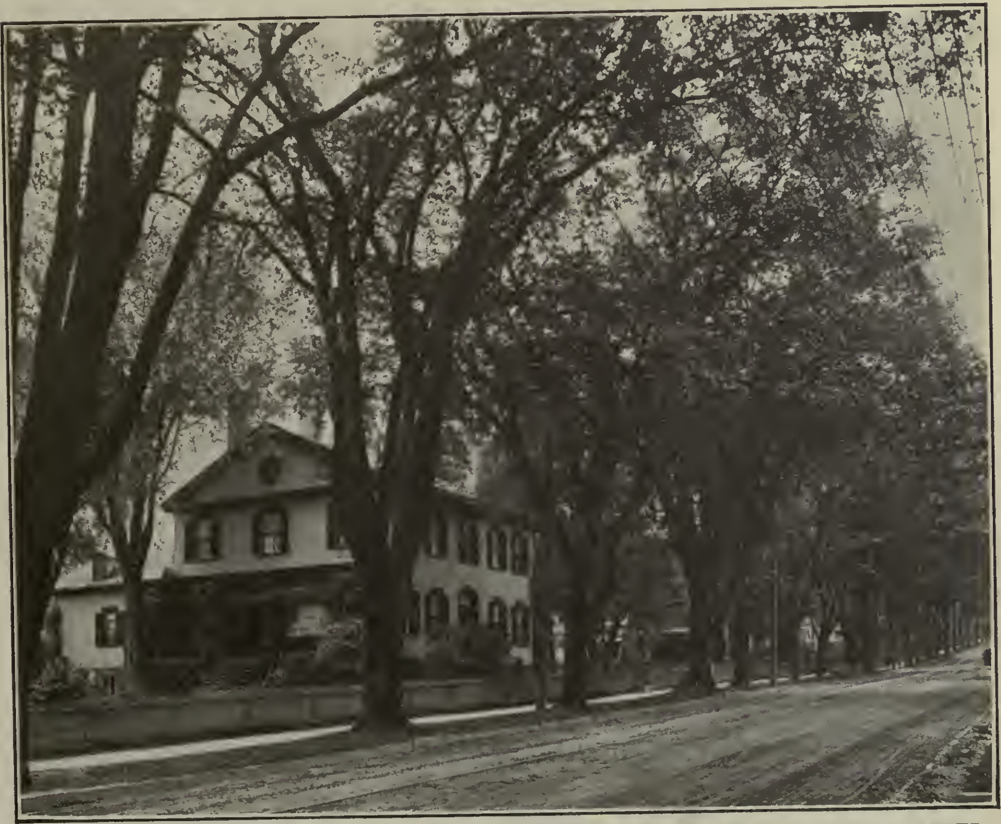
By C. M. Scherer

GRADUALLY the inhabitants of our cities and towns are coming to realize the value of their trees and consequently are putting forth greater efforts toward the preservation of these highly prized assets. Few there are, indeed, who are not desirous of knowing our trees, which one writer has designated as "the monarchs of all living things."

There is in Ohio a small suburban village noted for its wonderfully beautiful trees. For the last two or three years cankerworms have been playing havoc in this village to such an extent that the villagers, becoming alarmed, called in specialists to eradicate the pests. One of the most influential citizens was interested in knowing the value of the tree. His inquiry was answered by the direct question, "What amount of money would be necessary to secure your permission for the destruction of the village trees?" He saw the point immediately and replied that if the trees were gone he would go also.

This is an illustration of the sentiment throughout the country. Because of this sentiment there are great hopes for the future. Interest is aroused, from interest comes study, which is followed by knowledge. And at present a very high percentage of tree troubles can be traced directly to neglect due to ignorance. If every tree owner would learn trees and then apply his knowledge, America would soon have trees unrivaled by any in the world.

City trees have an exceedingly heavy



TREES IN BURLINGTON, VT., WITH TOP BRANCHES WELL ABOVE THE WIRES, BUT PLANTED TOO CLOSE TO GIVE PROPER SPACE FOR EACH TREE burden to bear, and it is often amazing to note the progress which they make. What farmer or suburban gardener would grow the same crops in the same soil during a period of fifty or even a hundred years without ever cultivating or fertilizing the soil to the slightest degree? Still, that is the condition under which many of our trees have to maintain themselves. Not only that, but much of the vitally necessary air and water is shut off and drained away by hard-surfaced streets and sidewalks. Then to complete the work, the good people put forth every effort to cover the remaining ground with a beautiful, heavy sod which is almost as impenetrable as the street. The grass making the sod is about as keen a competitor as one can imagine. The only practice deserving approval is the applying of fertilizer to make the grass grow, and, of course, the trees can gather a few grains.

In the city parks and lawns throughout the country almost the same conditions exist along the streets. The ground is made solid by the tramp of countless feet aided by frequent packing with the lawn roller. Too often the soil is exceedingly poor and shallow, and, with the poor treatment, proves too much for the most hardy tree, so that one should not be surprised when some beautiful specimen succumbs. Trees are probably as much desired in Central Park, New York, as in any other one place in the country, and it seems reasonably sure that with proper treatment of the soil as magnificent trees could be produced there as in any other locality.

A Life-and-Death Struggle

It would seem, from the foregoing, that enough difficulties have been shown to discourage the most persistent tree. A life-and-death struggle is the game, however, and some survive even with many added handicaps. The companies which furnish telephones, light, traction, water, gas and sewage disposal are never too careful of the trees along their rights of way. Still hundreds of other causes add to the difficulties encountered by city trees.

How many have seen telephone linemen carelessly and seemingly almost maliciously cutting and slashing beautiful city trees, ruining them for all time, for the purpose of getting free passage for their lines. Many times conduits can be placed under ground or at least run along alleyways, where the destruction will be reduced to a minimum. The same applies to light wires.

Trolley wires offer a little different problem. The solution is easy, however, and all that is necessary is by judicious pruning to lead the trees above the wires.

Installation of water, sewer, and gas mains causes the death of many trees each year. The injuries are possibly not so conspicuous or so lasting in the eyes of the general public, but the results are just as fatal. In the one case a large per cent of the manufacturing department of the tree is destroyed, while in the latter, a large part of the department which collects raw materials is cut away.

Too often one sees carelessness manifested by workmen around trees. Guy ropes for derricks, elevators and many other machines are fastened to trees. Trucks and wagons are driven against them. Other mishaps, too numerous to mention, cause serious injury to the trees. A large strip of bark is usually bruised or possibly even torn away. The result is a wound which will take years to heal, and in the meantime, unless particular care is given to that wound, insects and fungus enemies gain entrance, and in a comparatively short time the tree is gone forever.

Now how can municipalities guard against these troubles and give to the trees all the assistance possible in the endless struggle against their enemies? Beautiful trees can only be gained and maintained at the price of eternal vigilance. The authorities can best secure this by putting in charge a man thoroughly in sympathy with trees and thoroughly cognizant of their lives and adaptations. Then give him absolute power in regard to anything which concerns the trees. If it were possible, a prayer of thanksgiving would certainly arise from "the monarchs of all living things."

A good public water-supply is a valuable municipal asset, not only enhancing civic pride but attracting to the community desirable citizens, and manufacturers who use water in their industries.

Forward Steps
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

City Managers

A Good Mix

Waltham, Mass.—Believing that good feeling promotes good work, Waltham has undertaken a program to encourage friendliness and mutual acquaintance among its municipal employes. An air of formality and restraint seemed apparent among department heads and employes in the City Hall, there being no general sociability mixed with the day's work. To better this condition, it was suggested last winter that every man in the City Hall, whether department head or employe, young or old, go to the bowling alleys one evening. The effort met with success, and practically everyone was present. Teams were formed, the evening passed pleasantly, and the majority became enthusiastic over the game. Accordingly, a number of permanent teams were formed, and matches were held each Friday evening during the winter. Interest and enthusiasm gained steadily, and in a short time groups of officials and employes could be found around the score boards on Saturday mornings discussing the previous evening's game. In other words, City Hall folks began to "mix," and all became friends. This friendship extended further than the alleys—from office to office, with the result of better and more willing coöperation on the part of everyone. The season closed with regret.

The foundation of the get-together spirit had been laid, and during the summer the suggestion that an employes' outing be held met with instant favor. Accordingly, representatives were appointed by the City Manager from each department in the municipal organization, and plans were formulated. The affair was held on a Saturday afternoon, and practically every department was represented—Mayor, City Manager, and all. City trucks furnished transportation to the grounds, a farm on the outskirts of the city. After an excellent lunch, prepared by a foreman in the Water Department and his committee, a photograph was taken, and then a ball game and general sports provided an enjoyable afternoon. Some of the employes not attending the outing greatly regretted that they had missed the affair. One man was heard to ask, "Will you have another next week?" All had a good time, and without a doubt the outing will be repeated next summer.

All were eager to begin bowling again this season, and an invitation was sent to each department to enter a team in the Municipal Bowling League. As a result, all departments are represented and a twelve-team league is getting under way. It will be on the same plan as the organization of last year, but will include more employes and departments, thus broadening the scope of the opportunity of the official to mix with his men in an unofficial way. All are looking forward to another enjoyable winter.

HENRY F. BEAL,
City Manager.

Mayors

Charity or Graft?

Cedar Rapids, Mich.—In common with all other cities, Cedar Rapids has been troubled with great numbers of mendicants,—cripples, blind, and others,—who have applied for permission to sell pencils or novelties on the street corners, but who are in fact nothing but beggars trying to capitalize their afflictions by appeals to indiscriminate charity. As the city has a well-organized Social Welfare League, the municipal administration adopted the plan of referring all such applicants to the Welfare

League for investigation. Almost without exception, it was found that they were simply making a business of living off the public in this manner, that their homes were elsewhere, or that they were practically tramps. The Welfare League was supplied with signed permits to issue to any who had a worthy claim on the people for support, but in nearly two years not a single permit has been issued. A short time ago one of this class conceived the idea of applying for a regular license under local ordinance, which would cost $1 a day. This rather took us off our feet, and we issued one or two of them before it was realized that, after all, these people were still simply beggars.

Cedar Rapids is willing and ready to help persons in actual need, but it intends to protect its citizens from the wiles of unscrupulous professional mendicants who would prey upon their generosity.

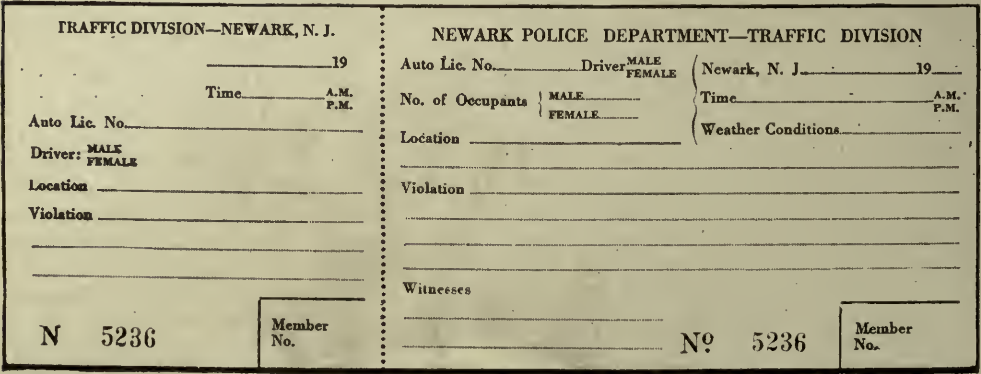
J. F. RALL,
Mayor.

Public Safety Departments

Prevention of Street Accidents

Newark, N. J.—This city has recently undertaken a successful campaign to reduce accidents due to traffic violations. First of all, on the theory that many violations were due to ignorance of the regulations, a small booklet was issued by the Department of Public Safety, and entitled "Traffic Laws, Regulations and Suggestions." This contained good advice to pedestrians as well as to motorists and drivers of horsed vehicles. The first order consisted of 10,000 booklets, which quantity, it was thought, would meet all requirements. This expectation was wrong, for the edition was entirely disposed of in about three weeks, through all sorts of channels. First, the Chamber of Commerce asked for and received 2,200; the Traffic Club of Newark, 800; other clubs and associations, several hundred each; the large department stores and many representative industrial institutions received several hundred; thousands more were distributed through the various police precincts, and many were given out to individuals who called for them at Police Headquarters. The mail brings in many letters of appreciation from those who have profited from these booklets. It has been suggested that one should be given to every applicant for a driver's license prior to his receiving his license.

Another part of the program is still more novel. William Brennan, Director of Public Safety, has permitted the formation of a Citizens' Traffic Squad of fifty representative business men, whose duties will be to keep a watchful eye in the direction of traffic and other law violators. To this end, each member of this squad is provided with a number and a form, like a postal card, on which he will report any violations that come within his notice. After the violation has been committed, the offender will receive a notice ordering him to report at a specified time to the Police Captain of Traffic, who will instruct him that a recurrence of the act will mean his being brought to trial and severely dealt with. Naturally, if the violation is of sufficient importance, the violator will be prosecuted forthwith. In about twenty days after the Citizens' Traf-



TRAFFIC DIVISION—NEWARK, N. J.

______19

Time______A.M. P.M.

Auto Lic. No.______

Driver: MALE FEMALE

Location ______

Violation ______

N 5236

Member No.

NEWARK POLICE DEPARTMENT—TRAFFIC DIVISION

Auto Lic. No.______Driver MALE FEMALE

No. of Occupants { MALE______ FEMALE______

Location ______

Newark, N. J.______19___

Time______A.M. P.M.

Weather Conditions______

Violation ______

Witnesses

№ 5236

Member No.

SPECIMEN OF CARD USED BY CITIZENS' TRAFFIC SQUAD IN REPORTING VIOLATIONS OF TRAFFIC ORDINANCES fic Squad was formed, violations to the number of 139 had been reported. The report card shows the nature of the violation and the number of the car. The Police Department, through the Police Traffic Captain, gets in touch with the state auto license commissioner at Trenton, who unhesitatingly furnishes the name and address of the owner of the offending car. The State Commissioner of Motor Vehicles is in hearty sympathy with this movement and does everything in his power to assist in its success.

It was at first feared that this special traffic squad, made up of private citizens, might overstep its authority; on this account, while it is true that Director Brennan had nothing whatever to do with the appointing of any of the members of the squad, he reserves the right to have any individual member of it recalled if he should become too officious. A very large meeting was held when the Citizens' Traffic Squad was organized, and it is thoroughly understood that it is not the duty of the members to make any arrests personally. Their function is simply, in case of a violation of the law, to secure the number of the car, and make the report accordingly, and leave the rest to the Police Department. It is understood, however, that in the event of the Department's wishing to prosecute any violator who has been reported, it would be necessary for the citizens who made the report to appear against him. Curtis R. Burnett is the permanent chairman of the Citizens' Traffic Squad; he is also president of the Boy Scouts.

Other features of the campaign should be effective in reducing the number of street accidents. On Sunday, November 21, police officers stationed at advantageous points throughout the city distributed to motorists thousands of gummed labels, with the request that they paste them to their cars. These pasters read, "Drive with Care," in large, red letters, with "Department of Public Safety, Newark, N. J." at the bottom.

Fifty thousand illustrated cards, urging parents to instruct their children in the dangers of street accidents, have been distributed throughout the homes of the city by the Boy and Girl Scouts. It is believed that the distribution will be complete, that is, every home will receive one. This cannot help but prevent many accidents which might be caused by carelessness. As a matter of fact, if the card is the direct cause of preventing a single accident only, the small expense, namely, the cost of the cards, will be more than offset.

T. M. FORD,
Police Commissioner.

Fire Departments

Fewer Fire Hazards in Terre Haute

Terre Haute, Ind.—Claiming to be the leader of Indiana cities in forwarding the work of fire prevention, Terre Haute has within the last few years instituted and demonstrated successful methods of promoting safety from fire.

Beginning in 1911 with the installation of a system of inspection of the business section of the city and the assignment of the first inspector of this sort in the state, the Fire Department has devoted a steadily growing amount of work to this feature. During the present year the results obtained have been evidenced, not only to the officials of the Fire Department but to the public at large, in several ways.

The Greater Terre Haute Club, an organization of representative citizens with the object set forth in the name, the Chamber of Commerce, the Junior Executive Club, the Merchants' Association, and other business and civic organizations have adopted resolutions and presented them to the City Council urging the adoption of an anti-shingle-roof ordinance for the parts of the city not included in the ruling now in effect.

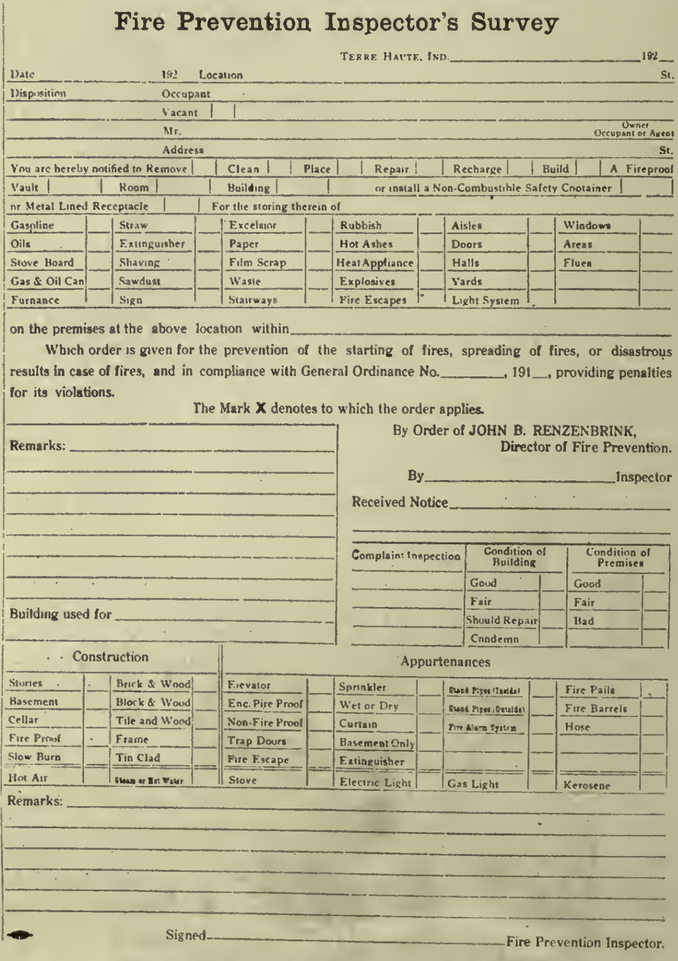
An annual Fire Prevention Day, on which special educational features are presented to the students of all public, private and parochial schools, has been set aside and observed. Literature of a sort calculated to impress the students has, with the coöperation of the Superintendent of Schools, carried the principles of fire prevention into the schools as part of the regular studies.

These things reflect the spirit in which the work has been received by the public. That spirit, the correlation of public interests and the interests of the individual citizens with the work of the Fire Department, has enabled the department to become a friend to the public and not a mere nonentity among the public utilities, and has stimulated the rapid growth of the idea of curtailing needless fire waste.

The first definite step in the work was taken by the department in the fall of 1911 when one fireman was assigned to a continuous inspection of the business district. At that time no other Indiana city had an inspector assigned from the Fire Department. One year later two men were detailed to inspection, working five hours each day except holidays and Sundays. These inspectors issued orders for the removal of hazards and made follow-up visits to insure prompt compliance with the orders. Also, in the latter part of 1911 ten men, one from each company, were assigned to inspections of the residential districts allotted to the various companies. Their duties, like those of the business section inspectors, were the detection and elimination of all fire hazards, but they concerned themselves mainly with the more common and dangerous hazards. Waste paper packing, excelsior, broken boxes and inflammable liquids were the principal features considered in the business section; ashes, rubbish and paper near buildings or fences, and dangerous flues and chimneys, claimed the most attention among the residences. Then, as now, the inspectors devoted little time to the finer points of building construction.

These continuous inspections, and quarterly inspections on a somewhat more extensive scale, have been maintained, and now constitute one of the more productive phases of fire prevention work in Terre Haute. In 1919 nearly 11,000 inspections were made. Of these, 5,245 were within the fire limits and 5,575 were out of the fire limits. During the first nine months of the present year 7,409 inspections were made, with an increase over the year 1919 in the proportionate number of inspections within the fire limits. Inspections of industrial plants are made at any time at the request of the management, and the plants inspected in the regular tours are usually visited by the entire company of that district.

The work of advancing the educational side of fire prevention was taken up by the schools in the fall term of 1920. Before that time, some attention had been given the work in schools where teachers happened to be unusually interested, but no organized system of instruction has been developed. Fire prevention as a basis for composition work in the English Departments of



Fire Prevention Inspector's Survey

Terre Haute, Ind.______________192__

Date __________ 192 Location __________ St.

Disposition __________ Occupant __________

Vacant ☐

Mr. __________ Owner Occupant or Agent

Address __________ St.

You are hereby notified to Remove ☐ Clean ☐ Place ☐ Repair ☐ Recharge ☐ Build ☐ A Fireproof Vault ☐ Room ☐ Building ☐ or install a Non-Combustible Safety Container ☐ or Metal Lined Receptacle ☐ For the storing therein of

Gasoline		Straw		Excelsior		Rubbish		Aisles		Windows	
Oils		Extinguisher		Paper		Hot Ashes		Doors		Areas	
Stove Board		Shaving		Film Scrap		Heat Appliance		Halls		Flues	
Gas & Oil Can		Sawdust		Waste		Explosives		Yards			
Furnance		Sign		Stairways		Fire Escapes		Light System			

on the premises at the above location within__________

Which order is given for the prevention of the starting of fires, spreading of fires, or disastrous results in case of fires, and in compliance with General Ordinance No.________, 191__, providing penalties for its violations.

The Mark X denotes to which the order applies.

Remarks: __________

By Order of JOHN B. RENZENBRINK,
Director of Fire Prevention.

By__________Inspector

Received Notice__________

Complain: Inspection	Condition of Building		Condition of Premises	
	Good		Good	
	Fair		Fair	
	Should Repair		Bad	
	Condemn			

Building used for __________

Construction				Appurtenances							
Stories		Brick & Wood		Elevator		Sprinkler		Stand Pipes (Inside)		Fire Pails	
Basement		Block & Wood		Enc. Fire Proof		Wet or Dry		Stand Pipes (Outside)		Fire Barrels	
Cellar		Tile and Wood		Non-Fire Proof		Curtain		Fire Alarm System		Hose	
Fire Proof		Frame		Trap Doors		Basement Only					
Slow Burn		Tin Clad		Fire Escape		Extinguisher					
Hot Air		Steam or Hot Water		Stove		Electric Light		Gas Light		Kerosene	

Remarks: __________

Signed__________Fire Prevention Inspector.

ETERNAL VIGILANCE IS THE PRICE OF SAFETY

The Terre Haute system of inspections is effective in preventing fires the two Senior and two Junior High Schools has been used this year with splendid results. Weekly periods of a few minutes each are given in many of the grade schools for talks on the work by the teachers.

The Boy Scouts, through seeking advanced ratings for proficiency in fire prevention and fighting, have become generally deeply interested in the work and have been no small factor in spreading education in the prevention of fires.

The increasing interest of owners and tenants since the installation of the inspections is shown by the great decrease in the number of orders for removal of hazards made by the inspectors. In 1920 about one-fifth of the number of orders issued in 1912 were made on a proportionate number of inspections. The value of cleaner and safer premises has appealed to the owners and occupants with such force that fewer orders are found necessary in any section than was formerly the case.

CARL E. EVINGER,
Fire Chief.

Forward Steps Gathered Here & There

Asheville's Water-Supply to Be Doubled

Asheville, N. C.—At a total cost of approximately $370,000, the city of Asheville is constructing a 16-inch cast iron pipe line that will double its present water-supply of 3,500,000 gallons a day. The total length of the new line when completed will be 51,300 feet, or 9.71 miles. The contract price is $349,826 for the system connected up with the intake on Bee Tree Creek and the reservoir on Beaucatcher mountain immediately to the west of the city. The contract was signed March 1st with a guarantee of completion within one year.

The laying of the 16-inch pipe line means the surmounting of a great many obstacles, in that the pipe is being hauled in wagons through a very rough and mountainous territory to the point nearest to the pipe line. From there the lengths of pipe are "snaked" to the trench, where they find a permanent resting place.

The intake on Bee Tree Creek is being constructed by R. C. Stevens under contract for $16,779.80, plus extra work and material, which amounts to a total of approximately $22,000. There are two settling basins 15 x 30 feet and 12 feet deep; a masonry concrete dam has been constructed across the creek, diverting the water through three fine-screened openings into the race leading to the settling basins.

The intake is located above human habitation, and the city owns the entire watershed of 7,000 acres, furnishing the head waters for this creek. This watershed of 7,000 acres is only a part of the 18,000-acre watershed owned by the city. The remaining tract of 11,000 acres furnishes the present supply of water through the old pipe line

SETTLING BASINS AT HEAD OF ASHEVILLE'S NEW 10-MILE PIPE LINE which was constructed 17 years ago and is 18 miles in length. Sections of the pipe taken up in the old line show the inside of the pipe as smooth as when laid down 17 years ago.

The present pipe line is approximately 80 per cent completed. All the work is being done under the personal supervision of R. J. Sherrill, Commissioner of Public Works of the city of Asheville. It is expected that the work will be completed by January 1, 1921.

In order to secure the proper grade for the new pipe line the ditches through many of the ridges are 15 to 20 feet deep.

N. BUCKNER,
Secretary, Board of Trade.

Toledo's Street Car Question Settled

Toledo, Ohio.—The street car question in Toledo has been permanently settled. By a vote of more than two to one, Toledo's electorate on November 2 approved the service-at-cost ordinance granting a franchise to the Community Traction Company, a newly incorporated company formed to take over the street railway interests of the Toledo Railways & Light Company. By approximately the same majority they voted down the two proposed bond issues for a municipal transportation system.

The new franchise will go into effect as soon as the Toledo Railways & Light Company and the Community Traction Company have filed with the Clerk of Council their formal acceptance of the ordinance, and the transfer of the property has been effected. The date of the transfer will be the date of the taking effect of the ordinance.

After these formalities have been completed, the first effects of the franchise upon the car-riding public will be in the lower fare that will go into operation at once. The fare will be reduced from its present level of seven cents cash fare and three tickets for twenty cents, and two cents for transfers, to the new rate of six cents cash fare, five tickets for thirty cents, and one cent for transfer. This rate will be in effect for six months, after which the fare will be determined automatically by the level of the reservoir known as the Stabilizing Fund.

Almost among the first steps to be taken will be the appointment of a Board of Street Railway Control by the Mayor. This board will be made up of three electors of the city of Toledo, appointed for terms of two years, four years and six years respectively. These three persons must not be in the employ of either the city or the company, nor the shareholders nor holders of bonds of the company, nor be members of the Ohio Legislature. They are to be unsalaried.

When the Board of Control has been organized it will select and recommend a Street Railway Commissioner, who will then be appointed by the Mayor. This Commissioner will be the paid representative of the Board of Control and the city, charged with the duty of protecting the rights of the public in the operation of the system. His salary, office rent, and supplies will be paid for by the company. His office will be in connection with other city offices, rather than with the company's offices, as is the case in some other cities where similar franchises are in effect.

Another immediate job of the Board of Control is the preparation of a plan for the rearrangement of the street railway system with a view to more efficient operation and better service. The franchise requires that this plan shall include provisions for a cross-town line. The only limitation placed on the Board in planning a rearrangement of the system is that it shall not involve a cost of more than one million dollars, nor impair the ability of the company to meet its obligations and earn its specified return on its investment.

Adoption of the franchise brings to a close a controversy that has gone on almost continuously since 1910, when several of the company's franchises expired. Several franchises that have been submitted to vote on various occasions have been defeated. One franchise embodying a community ownership scheme was prepared but was never submitted to vote on account of a break in the negotiations. Another franchise was prepared by the company and presented to council, but was never passed by council. On several occasions the people have declared in favor of municipal ownership, and at one election an $8,000,000 bond issue for a municipal system was approved. In November, 1919, the people approved an ouster ordinance ordering the company from the streets. Withdrawal of the cars in compliance with this ouster precipitated a series of events which led to the appointment of the two commissions whose respective reports were voted upon this week.

WENDELL F. JOHNSON,
Secretary of the Publicity and Efficiency Commission.

City Streets Reserved for Coasting

YOUNGSTOWN, OHIO.—As surely as snow falls, children will coast in the streets. And as surely as children coast in streets with normally heavy traffic, accidents will follow, unless effective measures are taken to prevent them. Usually such precautions are not taken until several children have been killed or maimed.

A SLIGHT INCONVENIENCE FOR MOTORISTS—BUT ADDED SAFETY FOR CHILDREN

Youngstown has adopted a simple plan, which has been tried for two years and found to be worth while. After several unfortunate accidents, the city, at the suggestion of the Playground Association, selected certain streets with good coasting grades and reserved them for the children. Signboards were prepared, as shown in the accompanying illustration, and placed about one block each side of the coasting area, so that automobilists would not be obliged to come clear up to the hill and then turn back. It was thought by the city administration that signs worded in this form would not render the city liable for any accidents which might occur.

The Fire Department coöperated in the plan and lent its trucks to assist in distributing the signs, and the police were asked to set up the signs at 4 o'clock P. M. whenever coasting was good, and to take them in at 10 o'clock P. M. On Saturday and Sunday the signs were left standing all day. The plan was well received by local automobilists, who were quick to appreciate its advantages; and the Automobile Club assisted in the plan by sending to its members a notice detailing the restricted areas.

The results of the plan have been most satisfactory. Of course, some children are still tempted to slide on hills near their homes which have not been closed to traffic. But as there has been scarcely an accident since the plan was adopted, the people feel that, considering the small amount of money and time invested, it has been a great benefit to the children of the city.

J. H. CHASE,
Supervisor, Youngstown Playground Association.

On the Calendar of Conventions

DECEMBER 8-10.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual congress. Secretary, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 9-11.—BRIDGEPORT, CONN.
National Housing Association. Annual conference. Secretary, Lawrence Veiller, 105 East 22d Street, New York, N. Y.

DECEMBER 13-16.—WASHINGTON, D. C.
American Association of State Highway Officials. Secretary, Joseph Hyde Pratt, State Highway Commission, Chapel Hill, N. C.

DECEMBER 28-30.—WASHINGTON, D. C.
American Political Science Association. Annual meeting. Secretary, Frederic A. Ogg, University of Wisconsin, Madison, Wis.

JANUARY 19, 1921.—NEW YORK CITY.
American Society of Civil Engineers. Secretary, Charles Warren Hunt, 33 West 39th Street, New York, N. Y.

FEBRUARY 7-12.—CHICAGO, ILL.
American Road Builders Association. Secretary, E. L. Powers, Editor *Good Roads,* 150 Nassau Street, New York, N. Y.

The Welfare Farm of the City of Toledo

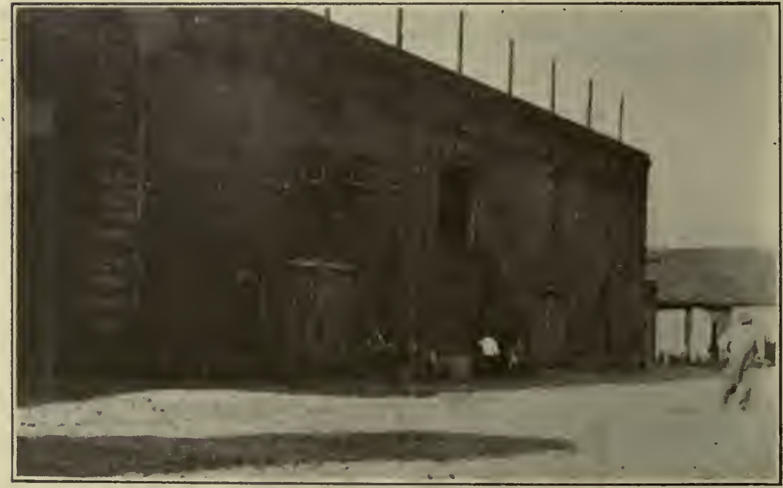
By Charles Russell

Professor of Agricultural Education, Toledo University, Toledo, Ohio

THE city of Toledo has had a workhouse for many years. As in other cities, there has always been in Toledo a certain proportion of its population who have not observed its laws. The penalties for the breaking of these laws ranged from money fines to imprisonment in a place where the breaker of laws could be secluded from society for a definite length of time. It would seem that this length of time was determined by the severity of the crime, and the imprisonment was to be thought of as a just punishment to fit the crime. No other considerations as to the existence of the workhouse seem to have been advanced.

The workhouse, a dark, damp, dismal building, iron-barred as to windows, iron-shuttered as to doors, filled with cells and smells and with all types of society's human derelicts, was situated on a small downtown piece of city property on the bank of a canal. Here were herded each day and each night those who by court decree had to undergo its miseries, and here, each morning, as terms of sentence expired, the iron-shuttered doors would open to allow egress to halting, stumbling, ill-dressed, ill-fed wrecks, both men and women. Those who remained were kept busy at something, mainly the making of brick. Why brick, no one knows, except that clay was available and that bricks were in demand. Such was the Toledo workhouse, a punishment to the offender and almost as great a punishment to the city. Such, too, may have been the workhouses of other cities, and their punishment.

As the years passed, the city grew, and as it increased in population, so did the city workhouse. It was soon overcrowded, and murmurs against it were heard. Finally it was decided to build a new workhouse and to build it in such a place that it could be enlarged if the future warranted it. The only thing to be changed was the site and the building. It was still to be a place of punishment and of imprisonment, something a bit more of a punishment and a bit more of an imprisonment than the city jail. The project took time, but finally a farm of three hundred acres was acquired about twenty miles from the city. Its chief virtues at the time were that a part of it had been a successful and fertile farm, and that another part of it contained an outcrop of limestone, a valuable product both for burning for lime as well as for crushing for roads, both of which operations could be substituted for the making of brick.



INTENSIVE TRAINING FOR WORTHLESSNESS

Courtyard of the old workhouse in Toledo, now being abandoned. The inmates are loafing because there is nothing else for them to do

The New Point of View

With the advent of the war the project was for the time shelved and the business of the city concentrated on doing its part to win the war. With the war

PREPARATION FOR BETTER CITIZENSHIP
On the new Welfare Farm in Toledo physical well-being is the basis of moral improvement

ended, the plans were revived, and with them came a change in ideals, a change in desires, and a change in plan. These changes have been due mainly to the efforts of Toledo's Commission of Publicity and Efficiency, and to the unswerving faith in human nature of Clarence A. Benedict, Director of Public Service. Mr. Benedict believed that if these law breakers were to be removed from society they should be removed for some definite *purpose,* and not for a definite *reason.* If that purpose was for punishment, then it had been adequately fulfilled, but if that punishment were for the purpose of preventing further crime, then that purpose was fulfilled not at all, for the workhouse population increased from year to year. Director Benedict believed that the purpose of the workhouse was not primarily to deal out punishment for the length of time prescribed by court sentences, but rather to utilize that time, which under present laws is all that can be utilized, for the correction of the causes which impelled individuals to break the laws. In other words, he recognized a fact that is becoming more self-evident with the passing of time, that the cause of the majority of petty law breaking is as much of a disease as tuberculosis or diphtheria. With this in mind, the name of the farm was changed to The Welfare Farm of the City of Toledo.

With the adoption of the new plans a Welfare Home was planned and is now completed. It was built in the center of the Welfare Farm, and so placed that the sun can shine into every ward. There is ample room for all that it will be asked to care for, as well as ample provision for cleanliness, sanitation, and the amelioration of disease.

Through the aid of the Commission of Publicity and Efficiency the services of the Department of Agriculture of Toledo University were secured to make a survey of the farm and to outline such agricultural possibilities and methods as would be in keeping with the policies of the Welfare Department, the ideals of the Welfare Director, and the possibilities of the Farm itself. Conferences were held by the University authorities with the Commission and with the Welfare Director. The ideals expressed and incorporated in the survey plans recognized first that moral responsibility was the basis of moral rectitude; second, that moral responsibility could only be attained through normal mentality; and third, that moral mentality, if present at all, could only be present in a state of physical health. The almost universal characteristic of the workhouse inmates has been poor physical health—physiques ruined perhaps by excesses, but more often showing the effects of malnutrition and wrong exercise. It was therefore decided to base the reconstructive, the welfare, processes upon the elements of proper food and proper care, to build upon that a normal mental atmosphere, and to see if through these elements a more enlightened and normal moral responsibility could not be developed.

In the development of the food situation a careful study was made of the foods actually used in the workhouse, and this study was submitted to Dr. Mary S. Rose, of Teachers College, Columbia University, one of the foremost authorities in dietetics in the United States, with a request that if necessary a revision be suggested which would be more in keeping with the ideals outlined above. With this revision as a basis the food units were divided into two groups—those which could be produced on the farm and those which could not. A practical farm system was modeled about the former group, and plans were drawn up for stock, crops, and production of various sorts, with the idea of providing through carefully worked out and supervised worthwhile work in their maintenance and production those elements necessary, aside from properly selected and produced food, in logical, healthful, physical rehabilitation. The plan provides for barns and workshops of a grade comparable to the Welfare Home itself, and for such stock, crops and other products as the farm can produce efficiently through the supervised labor of the patients.

The Hope for the Future

The future will see men and women taught through proper food and exercise how to adjust themselves to their environment, how to do for themselves those things that others cannot do for them, how to maintain through the integrity of their daily living those things which to normal-minded people are most highly valued, the working out to the best advantage of their own lives, the maintenance of their own happiness and the preservation of their own honor. The future will see these men and women, or a large proportion of them, gradually learning to make these adjustments of and by themselves and maintaining of their own will and desire that relation to society which society should value most—that of the good citizen.

One such rehabilitation would make the plan worth while, and far from sending out sulking, shrinking, discouraged, disheartened and under-nourished human derelicts, the city of Toledo hopes, through wise constructive plans and their vigorous execution, to take individuals committed to the city institutions and, instead of punishing them during their commitment, to so help them that in the end they may become useful, earnest, law-abiding citizens, a credit to themselves as well as to Toledo.

The Increase in Urban Population

THE figures of the present census show that the trend of population from the country to the city has become greatly accentuated since 1910 and that, for the first time in the country's history, more than half the entire population is now living in urban territory as defined by the Census Bureau. That is to say, of the 105,683,108 persons enumerated in the Fourteenth Census, preliminary tabulations show that 54,816,209, or 51.9 per cent, are living in incorporated places of 2,500 inhabitants or more, and 50,866,899, or 48.1 per cent, in rural territory. At the census of 1910 the corresponding percentages were 46.3 and 53.7, respectively, showing a loss of 5.6 per cent in the proportion for the population living in rural territory. To show more clearly the change in the proportion of the population living in rural territory now as compared with ten years ago, the rural population can be divided into two classes, namely, 9,864,196, or 9.3 per cent of the total population, living in incorporated places of less than 2,500 inhabitants, and 41,002,703, or 38.8 per cent of the total population, living in what may be called purely country districts. At the census of 1910, the population living in incorporated places of less than 2,500 inhabitants formed 8.8 per cent, while the population living in purely country districts formed 44.8 per cent of the total population.

The increase since 1910 in the population as a whole, as before stated, was 14.9 per cent, but during the decade there has been an increase in that portion of the population living in urban territory of 12,192,826, or 28.6 per cent, and in that portion living in rural territory of 1,518,016, or only 3.1 per cent; and if the comparison is extended to cover the two classes of rural territory, it appears that that portion living in incorporated places of less than 2,500 inhabitants shows an increase of 1,745,371, or 21.5 per cent, whereas that portion living in purely country districts shows an actual decrease of 227,355, or six-tenths of 1 per cent.

Water-Supply Statistics of Metered Cities

Tabulation of Data From Over 1,000 Cities in the United States and Canada

THROUGH the kind coöperation of over 1,000 water-works superintendents and engineers, as well as other municipal officials, THE AMERICAN CITY is able to publish for the benefit of its readers water-supply statistics covering a broader field and a larger number of communities than have hitherto been surveyed by any publication. The statistics include the 1920 population figures, with an asterisk to indicate figures already given out by the Census Bureau. The source of the water-supply is indicated by abbreviations which are listed below.

In order to pass any judgment regarding comparative meter rates in different communities, some idea of the method of treating the water is necessary. To this end the tabulation shows whether or not the water-supply is filtered, and the nature of the sterilizing agent, if such is used. The question of the accuracy of figures relating to the total average daily consumption can only be checked by a knowledge as to whether the supply is metered at the pump if it is pumped to a distribution system, or whether it is metered at the source if it is a gravity system. It will be noted that unfortunately a very small percentage of the cities have availed themselves of accurate methods of measuring the total supply to a city. As a check on pumpage, total consumption, the proper use and the needless waste of water, such meters are absolutely essential, and no water system should be without them.

The statistics of metered cities only have been included in this tabulation, and if a city has had 1 per cent or more of the services metered it has been included. Many cities still retain the cubic foot measurement of water in their meter rates, but, in order to make the tabulation uniform, all rates per 100 or per 1,000 cubic feet have been changed to an equivalent rate per 1,000 gallons for purposes of ready comparison.

Time has not permitted complete comparative studies of the data published herewith, but the material is presented for the benefit of water-works officials desiring to make a comparison of present meter rates in their own localities with those in other villages, towns or cities of similar size. The smallest town to report had a population of 30 people, and the response brought the good news that "water is as free as air." It is a fortunate community where such can be the case. In this instance a single mountain spring was the complete source of the water, and evidently all work had been done by the citizens themselves and there was always an overflow from the source. In cities, however, where water must be secured by pumping or where it must be filtered and sterilized, it becomes a valuable commodity, although not necessarily an expensive one; a number of cities have advertised in a unique manner the actual cost of water, showing that per cubic yard it is actually cheaper than dirt.

In order to make it possible to condense the large volume of material in a reasonably small space, a system of symbols has been adopted as follows:

(P)—Indicates private ownership of the water-works
*—Indicates U. S. Bureau of the Census population figures for 1920
A.W.—Artesian Well
B.—Bay
Br.—Brook
C.—Canal
Cr.—Creek
D.W.—Deep Well
I.G.—Infiltration Gallery
Imp.—Impounded
L.—Lake
P.—Pond
Res.—Reservoir
Ri.—River
Sp.—Spring
St.—Stream
W.—Well
Chl.—Liquid Chlorine
Hyp.—Hypochlorite of Lime
Chem.—Chemicals

The following table will be completed in the January issue of THE AMERICAN CITY. If your city is not represented, please send us the correct data at once, or if any error is noted, please inform us, so that it may be corrected immediately.

Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal	Commercial per 1,000 gal	Minimum Annual Charge
ALABAMA													
Albany............(P)	13,400	Ri.	Yes	Chl	1,750,000	131	No	2,890	600	21	24c	8c	$6.00
Anniston..........(P)	*17,734	Sp.	No	Chl	3,500,000	200	No	2,800	2,000	72	26.6c	6c	$8.00
Bridgeport.........(P)	2,500	Sp.	No	No	250,000	100	No	250	100	40	50c	15c	15.00
Evergreen...........	1,900	A.W.	No	No	50,000	26	No	227	212	94	35c	25c	9.00
Eufaula.............	6,500	Cr.	Yes	Chl	500,000	77	No	500	300	60	37c	9c	24.00
Gadsden.............	16,000	Ri.	Yes	No	1,250,000	78	Yes	2,215	2,215	100	33.3c	6.7c	9.00
Mobile..............	*69,151	Cr.	No	Hyp	10,500,000	175	No	14,050	7,868	56	15c	10c	6.00
Montgomery..........	*43,464	W.	No	No	4,500,000	104	Yes	9,250	7,000	76	15c	10c	12.00
Prattville..........	2,450	A.W.	No	No	70,000	29	No	220	140	64	50c	22c	2.64
Union Springs........	4,000	W.	No	No	175,000	44	No	377	214	57	26.7c	26.7c	30.00
Uniontown..........	1,800	W.	No	No	100,000	56	No	275	275	100	31.8c	15.5c	14.00
ARIZONA													
Nogales.............	8,000	W.	No	No	1,000,000	125	No	1,050	1,050	100	40c	18c	None
Prescott.............	8,000	St.-Sp.	No	Chl	500,000	63	No	1,000	1,000	100	$1.00	25c	$24.00
Tombstone.........(P)	1,500	Sp.	No	No	100,000	67	No	325	319	98	1.00	25c	18.00
Williams............	1,800	St.	No	No	150,000	84	No	287	117	41	1.50	50c	18.00
ARKANSAS.													
Blytheville..........	8,000	W.	No	No	300,000	38	No	825	825	100	40c	10c	18.00
Camden...........(P)	......	Ri.	Yes	Chl	180,000	....	No	642	415	65	62.5c	30c	15.00
De Queen...........	3,500	W.	No	No	40,000	11	Yes	400	325	81	50c	25c	6.00
Fayetteville.........	5,362	Ri.	Yes	Chem	500,000	93	No	1,200	800	67	45c	15c	6.00
Harrison............	4,000	Sp.	No	No	165,000	41	Yes	500	320	64	35c	8c	12.00
Helena............(P)	12,000	W.	No	No	1,200,000	100	Yes	1,650	1,290	78	50c	15c	15.00
Pine Bluff.........(P)	15,102	W.	No	No	1,200,000	80	Yes	3,400	3,400	100	50c	15c	10.80
CALIFORNIA													
Arcata............(P)	2,000	St	No	No	250,000	125	No	600	317	53	35c	20c	$12.00
Benicia............(P)	3,500	Res	Yes	Chl	525,000	150	Yes	608	600	99	60c	29c	18.00
Calexico............	6,223	Ri	Yes	Chl	1,000,000	17	No	1,200	1,200	100	10c	10c	12.00
Daly City...........	6,000	W	No	No	175,000	29	No	1,150	1,150	100	40c	30c	12.00
Eureka..............	*13,212	Ri	Yes	Chl	1,000,000	76	No	3,338	2,792	84	32c	20c	....
Fillmore.............	2,400	W	No	No	240,000	100	No	479	333	70	20c	13.3c	18.00
Lodi................	5,000	W	No	No	700,000	140	No	1,500	50	3	7c	5c	6.00
Los Angeles..........	578,000	Res-Ri	No	No	82,000,000	144	No	114,000	101,250	89	13.3c	6.7c	$9.00
Ontario.............	1,800	W	...	...	769,845	427	Yes	1,908	1,908	100	13.3c	10.7c	....
Oxnard..............	4,500	A.W	No	No	900,000	200	No	865	4	1	15c	7c	....
Pacific Grove, etc...(P)	10,000	Ri	No	Chl	607,000	61	No	4,000	3,300	83	49c	33.3c	13.20
Palo Alto............	7,000	W	No	No	750,000	107	Yes	1,607	1,607	100	16c	16c	6.00
Riverside............	19,500	A.W	No	...	5,122,766	262	No	5,057	753	15	40c	6.7c	9.00
San Diego...........	*74,683	Imp	Yes	Chl	10,000,000	134	...	16,000	16,000	100	14.7c	14.7c	....
Santa Clara..........	6,000	W	No	No	2,000,000	333	No	1,350	150	11	19c	10c	12.00
St. Helena.........(P)	1,800	Sp.-Cr	No	No	100,000	56	No	348	348	100	25c	15c	12.00
Sherman...........(P)	1,500	Sp.-W	No	Hyp	37,500	25	No	325	200	62	10c	9c	None
Stockton...... ....(P)	*40,296	W	No	No	9,000,000	220	Yes	8,000	2,000	25	25c	10c	12.00
Visalia............(P)	10,000	W	No	No	1,500,000	150	No	1,400	30	2	25c	15c	12.00
Watsonville..........	6,000	Cr.-W	Yes	Chl	1,500,000	250	Yes	1,730	212	12	20c	20c	12.00
COLORADO													
Ault................	1,200	W	No	No	30,000	25	No	212	150	71	20c	20c	$24.00
Boulder.............	*10,989	St	No	Chl	4,500,000	413	Yes	1,861	460	25	20c	3c	5.00
Brush....	2,200	W	No	No	300,000	137	Yes	456	175	38	15c	10c	12.00
Colorado Springs......	*30,105	St	No	No	6,217,550	206	No	12,333	225	2	15c	8c	12.00
Fort Collins..........	9,000	Ri	Yes	Hyp	4,000,000	445	No	2,500	350	14	20c	4c	12.00
Fort Morgan..........	5,000	W	No	No	1,000,000	200	No	1,010	15	1	25c	5c	12.00
Greeley.............	12,000	Ri	Yes	No	5,000,000	417	Yes	2,300	400	17	20c	6c	....
La Junta............	7,000	W	No	No	1,500,000	214	Yes	1,000	20	2	15c	7c	....
Longmont............	6,000	Ri	No	Chl	1,750,000	292	No	1,500	125	8	15c	3.5c	24.00
Trinidad............	*10,906	Ri	No	No	5,000,000	458	Yes	3,376	358	11	40c	7c	19.20
CONNECTICUT													
Ansonia...........(P)	*17,643	Br	No	Chl	1,510,000	86	Yes	1,198	703	59	24c	6.7c	$8.00
Bridgeport,........(P)	*143,538	St	No	Chl	30,000,000	209	Yes	23,400	3,941	17	18c	4.3c	10.00
East Ansonia.......(P)	12,000	Imp	No	Chl	1,500,000	25	Yes	1,200	705	59	24c	6.6c	8.00
East Hartford.........	15,000	Sp.-Br	No	No	2,500,000	67	...	2,200	45	2	30c	8c	25.00
Groton..............	3,500	L	No	No	1,500,000	29	Yes	1,000	760	76	25c	9c	7.50
Hartford.............	*138 036	Imp	No	Chl	12,900,000	94	Yes	16 360	15,950	98	16c	8c	5.000
Meriden.............	*29,842	Res	No	No	3,500,000	118	Yes	3,675	1,375	37	15c	10c	7.50
Middletown..........	16,000	Res	No	Chl	1,536,000	96	Yes	2,419	2,389	99	$1.20	50c	5.00
New Britain..........	*59,316	Br.-C	No	Yes	500,000	8	Yes	5,542	5,607	100	10c	5.5c	5.00
Norwich.............	*29,685	Imp	No	No	2,500,000	84	Yes	5,000	1,475	30	26.7c	3.3c	5.00

Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal	Lowest Commercial per 1,000 gal	Minimum Annual Charge
CONN.—Continued.													
Plainville	4,200	Res.-W	No	No	350,000	83	No	537	225	42	33.3c	9.3c	$13.00
Putnam	8,000	Ri	Yes	No	900,000	113	No	1,144	90	8	20c	10c	....
Ridgefield (P)	3,188	L	No	No	146,886	46	No	398	332	86	48c	12c	12.00
Rockville (P)	9,000	L	No	No	Unknown	....	No	1,274	470	37	20c	5c	6.00
Southington	8,400	St	No	No	675,000	80	No	1,327	131	10	33.3c	5.3c	12.00
South Manchester (P)	12,000	Res	No	No	1,250,000	104	Yes	1,900	1,900	100	26.7c	6.7c	6.00
Stamtord (P)	*35,086	Ri	No	Chl	4,500,000	112	No	4,700	3,900	83	20c	12c	6.00
Willimantic	*12,330	Ri	Yes	Chl	1,000,000	84	No	1,657	1,495		25c	25c	6.00
Winsfed	9,500	Ri	No	No	1,500,000	158	No	1,200	130	11	9c	4c	5.00
DELAWARE													
Georgetown	2,000	W	No	No	50,000	25	No	175	3	2	....	30c	$10.00
Wilmington	*110,168	Cr	Yes	...	14,835,446	135	Yes	22,553	19,301	86	10c	7.3c	10.00
DIST. OF COLUMBIA													
Washington, D. C.	*437,571	Ri	Yes	...	62,553,490	143	Yes	72,149	61,385	85	10c	6.7c	5.65
FLORIDA													
Daytona	5,000	W	No	No	400,000	80	No	942	960	100	15c	....	$5.00
Fort Myers	5,000	W	No	No	150,000	30	No	230	250	100	$1.50	20c	....
Fort Pierce	3,500	W	No	No	250,000	72	No	450	225	60	10c	10c	10.00
Miami (P)	*29,549	W	No	Chl	2,500,000	85	Yes	5,500	5,500	100	20c	8c	12.00
Ocala	7,000	W	No	...	709,000	101	Yes	......	800	...	16.7c	....	....
St. Augustine	6,132	W	No	No	600,000	98	No	1,300	300	23	11c	8c	12.00
St. Petersburg	*14,237	W	No	Chl	500,000	35	No	3,111	3,076	99	20c	12c	6.00
GEORGIA													
Albany	*11,555	W	No	No	1,000,000	87	Yes	2,000	1,900	95	20c	10c	$9.00
Americus	9,500	W.-Sp	No	...	600,000	63	No	1,350	1,350	100	20c	15c	10.20
Athens	*16,748	Cr	Yes	Chl	1,500,000	90	No	2,115	1,980	94	25c	10c	....
Atlanta	*200,616	Ri	Yes	Chl	25,000,000	125	Yes	33,000	33,000	100	13.3c	9.3c	9.60
Augusta	*52,548	Ri	Yes	Chl	7,000,000	133	No	7,500	7,500	100	25c	12.5c	9.00
Boston	2,000	W	No	No	100,000	50	No	350	100	29	50c	25c	18.00
Canton	3,500	Ri	Yes	...	200,000	57	No	365	365	100	25c	15c	9.00
Commerce	2,500	Cr	Yes	Chl	200,000	80	No	425	425	100	35c	30c	15.00
Marietta	7,000	W	No	Chl	288 000	41	No	1,000	1,000	100	20c	13c	9.96
Newman	6,500	W.-St	No	Chl	300,000	46	No	775	775	100	20c	7c	7.20
Savannah	*83,252	W	No	No	12000,000	44	Yes	10,000	1,800	18	14c	6c	....
Sylvania	2,000	W	No	No	60,000	30	No	200	200	100	40c	....	....
Thomasville	8,000	W	No	No	425,000	53	Yes	1,050	1,050	100	18c	18c	12.00
Waynesboro	3,311	W	No	...	300,000	91	No	373	290	78	40c	30c	1.50
Winder	4,000	Cr	Yes	Chl	225,000	56	Yes	398	226	57	25c	10c	10.80
HAWAII													
Honolulu	*83,327	St	No	Chl	24,000,000	288	Yes	8,991	2,007	22	10c	5c	6.00
IDAHO													
Boise	28,000	Ri.-W	No	No	2,760,000	99	No	5,337	4,665	87	27c	12.5c	$12.00
Coeurd'Alene (P)	7,500	L	No	No	2,000,000	267	No	1,800	100	6	40c	10c	24.00
Genesee	775	W	No	No	10,000	13	No	165	150	91	$1.00	15c	12.00
Lewiston	8,500	Ri	No	Chl	4,000,000	471	Yes	1,750	1,300	74	22.7c	5.3c	14.40
Sandpoint	5,000	Cr	No	No	Unknown	...	No	900	25	3	20c	5c	....
Shelley	1,250	W	No	No	120,000	96	...	275	60	22	50c	25c	18.00
Weiser	4,500	Ri	No	Chl	300,000	67	Yes	700	700	100	26.7c	10.7c	18.00
ILLINOIS													
Atkinson	900	W	No	No	12,000	13	No	75	75	100	40c	10c	6.00
Bloomington	*28,725	W	No	No	2,500,000	87	No	6,462	6,454	100	35c	10c	3.75
Bushnell	3,000	W	No	No	100,000	33	Yes	400	400	100	25c	15c	9.00
Cairo (P)	15,000	Ri	Yes	Chl	3,000,000	200	Yes	3,000	325	11	27c	7c	6.00
Canton	*10,928	W	No	No	400,000	37	...	1,500	1,500	100	40c	32c	4.20
Centralia	12,000	Res	No	Chl	1,400,000	117	No	1,200	1,200	100	40c	7c	6.00
Champaign (P)	*15,873	W	Yes	Chl	2,500,000	158	No	5,800	5,200	91	35c	8c	6.00
Chicago Heights	*19,653	W	No	No	4,500,000	229	No	3,200	2,200	69	50c	10c	4.00
Cicero	*44,995	L.	No	Chl	5,652,750	126	Yes	6,500	6,500	100	13.3c	13.3c	6.00
Colfax	1,000	W	No	No	35,000	35	No	142	142	100	25c	20c	16.00
Decatur	*43,818	Ri	Yes	Chl	6,500,000	148	Yes	7,900	7,875	100	8c	3c	4.00
De Kalb	9,000	W	No	No	500,000	56	Yes	1,800	1,800	100	40c	10c	6.00
Dwight	3,000	W	No	No	250,000	83	Yes	1,600	300	19	30c	10c	6.00
Evanston	*37,215	L.	Yes	Hyp.	6,000,000	161	Yes	7,200	7,000	97	16c	6.8c	6.00
Forest Park	*10,768	W	No	No	1,500,000	140	No	1,300	1,300	100	30c	30c	....

Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal	Lowest Commercial per 1,000 gal	Minimum Annual Charge
ILLINOIS—(Cont)													
Freeport (P)	*19,669	W	Yes	No	2,750,000	140	No	4,792	4,250	89	41.2c	3.3c	$7.56
Hopedale	600	W	No	No	75,000	125	Yes	64	42	66	35c	30c	....
Jacksonville	*15,713	Cr	No	No	1,000,000	64	No	1,750	1,750	100	60c	12c	....
Lake Forest	6,000	L	Yes	Hyp	700,000	117	Yes	833	833	100	21c	21c	6.00
Lanark	1,400	W	No	No	60,000	43	No	225	40	18	40c	20c	6.00
Lincoln (P)	*11,882	W	No	No	1,000,000	84	No	1,969	1,936	98	26.7c	6.7c	6.00
Manteno	1,400	W	No	No	33,600	24	No	....	3	....	25c	10c	....
Monticello	2,400	W	No	No	100,000	42	No	600	350	58	20c	10c	6.00
Mount Vernon (P)	12,000	Res	Yes	Hyp	650,000	54	Yes	1,448	1,400	97	37.5c	8.8c	3.00
Moweaqua	1,800	W	No	No	20,000	11	Yes	115	115	100	20c	15c	6.00
Naperville	4,000	W	No	No	127,500	32	No	819	819	100	13c	13c	6.00
Peoria (P)	76,121	W	No	No	8,350,000	110	Yes	17,769	10,631	60	30c	3c	3.20
Peru	9,500	W	No	No	600,000	63	Yes	4,100	2,400	59	21.3c	12c	....
Princeton	4,100	W	No	No	300,000	73	Yes	1,250	1,250	100	75c	33c	4.00
Quincy	*35,978	Ri	Yes	Chl	2,000,000	56	Yes	6,900	5,100	74	50c	8c	10.00
Rock Island	*35,177	Ri	Yes	Chl	3,500,000	100	No	7,000	3,000	43	18.7c	8c	$8.10
Steger	3,000	W	No	No	100,000	33	No	300	300	100	24c	10c	12.00
Streetor	15,000	Ri	Yes	Chl	2,450,000	163	...	4,100	2,400	59	21.3c	12c	....
Washington	1,800	....	No	No	150,000	84	No	645	350	54	35c	35c	....
Waukegan	*19,199	L	No	Chl	5,000,000	261	No	3,900	800	20	17c	6c	5.00
White Hall	3,000	Res	No	No	165,000	55	Yes	335	335	100	25c	6c	6.00
Winnetka	6,694	L	No	Chl	688,000	105	Yes	1,500	1,500	100	15c	7c	4.00
INDIANA													
Alexandria	4,172	W	No	No	360,000	86	No	758	124	16	20c	6c	$10.00
Batesville (P)	2,300	Res	No	No	85,000	37	No	88	73	83	30c	8.5c	10.00
Bluffton	5,500	W	No	No	2,500,000	46	No	912	950	100	23c	11c	7.00
Decatur	4,800	W	No	No	300,000	63	No	900	900	100	25c	20c	4.80
Elkhart (P)	*24,277	W	Yes	No	1,361,997	56	Yes	5,588	5,021	85	12c	8c	10.00
Elwood (P)	15,000	W	No	No	900,000	60	No	1,500	1,065	71	30c	15c	7.20
Evansville	*85,264	Ri	Yes	Chl	8,000,000	94	No	14,987	7,000	47	20c	5c	2.00
Flora (P)	1,800	W	No	No	25,000	14	No	255	250	98	50c	20c	10.00
Fort Wayne	*86,549	W	No	No	5,698,059	66	Yes	22,700	17,500	77	16c	6.5c	6.00
Huntington	*14,000	W	No	No	1,300,000	100	Yes	2,750	2,750	100	40c	13.3c	6.00
Kendallville	6,000	W	No	No	300,000	50	No	1,177	1,177	100	25c	10c	4.20
Lafayette	*22,456	W	No	No	4,000,000	179	No	5,483	1,394	26	20c	6c	5.00
La Porte	*15,158	W	No	No	2,200,000	145	No	3,100	298	10	10c	4c	6.00
Lebanon	7,000	W	No	No	450,000	64	No	1,700	1,615	95	25c	14c	5.00
Mishawaka	*15,195	W	No	No	1,250,000	82	Yes	3,100	2,750	89	13.3c	6.3c	6.00
New Albany	*22,992	Ri	Yes	Chl	2,500,000	109	Yes	4,650	420	9	22c	7c	1.50
No Manchester	2,800	W	No	No	177,512	63	Yes	581	556	96	15c	8c	4.00
Orleans (P)	1,500	W	No	No	200,000	133	No	150	150	100	25c	6c	12.00
Plymouth	5,500	W	No	No	Unknown	....	No	855	875	100	25c	6c	12.00
Richmond (P)	*26,765	I G	No	No	2,622,000	98	Yes	5,680	4,290	76	20c	5.8c	6.00
Rushville	6,000	W	No	No	450,000	75	No	1,400	1,400	100	18c	4c	4.00
Seymour (P)	7,600	Ri	Yes	Chl	1,000,000	132	Yes	1,400	176	13	30c	8c	12.00
South Bend	*70,983	W	No	No	5,000,000	71	Yes	13,500	13,500	100	12c	8c	7.20
Spencer	3,000	W	No	No	102,000	34	Yes	750	200	27	15c	15c	12.00
Terre Haute (P)	*66,083	Ri	Yes	Yes	4,887,600	74	No	7,945	7,750	98	25c	5.8c	9.00
Union City	6,000	W	No	No	473,304	79	No	......	1,430	....	20c	8c	6.00
Wabash (P)	10,000	W	No	No	1,750,000	175	No	2,300	700	30	33.3c	13.3c	12.00
IOWA													
Albia	5,138	Res	No	...	175,000	34	Yes	475	475	100	50c	15c	$6.00
Algona	3,500	W	No	...	110,000	32	No	812	795	98	40c	20c	7.20
Anamosa	3,150	W	No	No	33,000	105	No	420	360	86	40c	12.5c	None
Atlantic	5,500	W	No	No	600,000	109	Yes	1,500	300	20	30c	10c	12.00
Bloomfield	2,028	W	...	...	80,000	40	No	......	250	...	40c	30c	6.00
Boone	14,000	Ri	No	Chl	950,000	68	No	2,050	2 050	100	66.7c	11c	8.00
Burlington	24,064	Ri	Yes	Chl	2,515,931	105	No	5,675	225	4	30c	10c	None
Cedar Falls	6,500	W	No	No	900,000	139	...	1,600	1,325	83	30c	6.7c	9.00
Cedar Rapids	*45,566	Ri-W.	Yes	Chl	3,800,000	82	No	8,868	8,776	99	25.3c	9.3c	9.00
Centerville (P)	8,500	Imp	Yes	Chl	400,000	47	Yes	950	945	99	50c	15c	6.00
Charles City	7,350	W	No	No	375,000	51	No	1,050	1,100	100	30c	7c	....
Cherokee	5 000	W	No	No	250,000	50	Yes	1,000	1,000	100	25c	25c	4.00
Clarinda	5,000	Ri	Yes	Chl	260,000	52	Yes	940	940	100	53.3c	16c	6.00
Council Bluff	*36,162	Ri	Yes	Chl	4,500,000	125	No	7,500	7,500	100	35c	10c	6.00
Creston (P)	8,800	Res	Yes	Chl	800,000	91	Yes	1,085	1,060	98	35c	10c	10.00

Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal.	Lowest Commercial per 1,000 gal	Minimum Annual Charge
IOWA—(Continued.)													
Decorah	4,100	W	No	No	Unknown	....	Yes	800	750	94	31c	7.5c	$5.00
Denison	5,000	W	No	No	500,000	100	No	1,600	1,500	94	50c	30c	6.00
Des Moines	*126,468	I G	No	Chl	10,000,000	80	Yes	23,000	23,000	100	30c	10c	4.00
Elkader	1,500	W	No	No	60,000	40	No	280	250	89	30c	12c	4.00
Elliott	600	W	No	No	5,000	8	No	85	85	100	40c	40c	....
Fairfield	7,000	Res	Yes	...	350,000	50	Yes	1,000	985	99	53.3c	15c	9.00
Fort Madison (P)	15,000	Ri	Yes	...	600,000	40	Yes	1,300	130	9	60c	15c	12.00
Hamburg (P)	2,200	Sp-W.	No	No	20,000	23	No	210	210	100	50c	20c	6.00
La Porte City (P)	1,600	W	No	No	17,000	106	No	240	225	94	40c	20c	9.00
Maquoketa	4,000	W-St	No	No	250,000	62	No	1,000	1,000	100	16.7c	10c	6.00
Marathon	650	W	No	No	150,000	231	No	91	91	100	30c	12.5c	5.00
Marion (P)	5,000	Sp	No	No	450,000	90	No	1,000	800	80	32c	10c	....
Mason City	*20,065	W	No	No	2,000,000	100	Yes	4,000	4,000	100	50c	15c	4.00
Mount Pleasant	4,500	W	No	No	125,000	28	Yes	650	650	100	50c	20c	4.00
Muscatine	18,000	W	No	...	1,500,000	84	Yes	3,950	2,400	61	33.3c	10.7c	6.00
Osceola	2,750	St-W	Yes	...	60,000	22	No	210	210	100	75c	75c	12.00
Oskaloosa	9,466	W-Ri	Yes	Chl	1,250,000	132	No	2,000	600	30	60c	30c	9.00
Ottumwa	*23,003	Ri	Yes	Chl	2,250,000	98	Yes	3,000	2,500	83	25c	6.3c	9.00
Rockwell	900	W	No	No	Unknown	...	No	54	47	88	50c	29c	....
Sibley	1,803	W	No	Chl	70,000	36	No	250	250	100	50c	40c	12.00
Sioux City	*71,227	W	No	No	5,500,000	77	Yes	10,600	10,420	98	25c	10c	None
Storm Lake	3,628	L.	Yes	Yes	200,000	55	No	600	600	100	35c	11c	$6.00
Stuart	2,000	W	No	No	Unknown	....	No	200	......	....	40c	30c	....
Tifton	2,100	W	No	No	130,000	62	Yes	585	585	100	40c	20c	5.00
Toledo	1,626	W	...	...	60,000	38	No	368	300	82	40c	15c	7.00
Traer	1,373	W	No	...	Unknown	....	No	310	220	71	40c	15c	4.80
Villisca	2,030	W	No	...	45,000	22	No	300	300	100	50c	10c	5.00
Washington	5,000	W	No	No	300,000	60	No	1,090	1,090	100	40c	15c	8.00
Waverly	3,205	W	No	...	123,000	38	No	650	650	100	40c	10c	4.00
Winterset	3,000	W	No	No	50,000	16	No	340	340	100	40c	15c	6.00
KANSAS													
Atchison (P)	14,000	Ri	No	Hyp	1,500,000	107	No	3,000	600	20	35c	9c	$7.20
Chanute	*10,286	Ri	Yes	Chl	1,500,000	146	Yes	2,100	2,100	100	30c	10c	3.00
Clay Center	5,000	W	No	No	600,000	120	Yes	900	890	99	25c	8c	7.20
Emporia	*11,273	Ri	Yes	Chl	2,000,000	178	...	2,600	2,600	100	30c	6.5c	None
Erie	1,500	W	No	No	250,000	167	No	350	350	100	50c	20c	12.00
Esbon	600	W	No	No	10,000	17	No	50	50	100	50c	15c	10.00
Fort Scott	*10,693	Ri	No	Chl	1,500,000	140	No	2,000	2,000	100	27.5c	9c	1.00
Fowler	475	W	No	No	11,000	23	No	120	120	100	5c	5c	15.00
Fredonia	4,000	Ri	Yes	Hyp	330,000	83	No	950	750	79	25c	10c	9.00
Great Bend	5,000	W	No	No	1,500,000	300	No	650	600	92	30c	12.5c	12.00
Hiawatha	3,100	Sp	No	No	200,000	65	...	750	750	100	40c	15c	None
Holton	3,000	Sp	No	No	80,000	27	No	535	535	100	$1.00	15c	12.00
Independence	12,000	Ri	Yes	Chl	2,000,000	167	No	3,800	2,800	74	30c	7.5c	6.00
Junction City	7,500	W	No	No	750,000	100	Yes	1,850	1,850	100	25c	8c	9.00
Manhattan	7,200	W	No	No	1,000,000	139	Yes	2,100	2,100	100	20c	7c	7.00
McPherson	4,700	W	No	No	350,000	75	Yes	1,000	1,000	100	25c	8c	6.00
Miltonvale	1,200	W	No	No	60,000	50	No	150	150	100	50c	10c	9.00
Minneapolis	2,000	Ri	No	No	300,000	150	Yes	600	600	100	25c	5c	6.00
Osage City	2,930	Res	Yes	Hyp	60,000	21	No	452	452	100	40c	15c	None
Osawotomie	5,000	Ri	Yes	Chl	1,000,000	200	No	500	490	98	30c	8c	50c
Pittsburg	*18,052	W	No	No	2,000,000	111	Yes	5,097	1,959	38	25c	13c	6.00
Topeka	*50,022	W	No	Chl	4,000,000	80	Yes	9,070	9,872	100	45c	12c	4.80
Wakeeny	1,000	W	No	No	350 000	350	No	275	275	100	15c	10c	6.00
Wamego	1,800	W	No	No	150,000	84	No	420	412	98	30c	7.5c	6.00
Wellington	7,200	W	No	...	1,200,000	167	No	2,500	2,500	100	20c	15c	9.00
Wilson	1,200	W	No	No	75,000	63	No	350	300	86	25c	25c	9.00
KENTUCKY													
Ashland	*14,729	Ri.	No	Chl	1,200,000	81	Yes	2,700	1,449	54	35	50c10c	$12.00
Bardwell	1,500	W.	No	No	30,000	20	No	235	40	17	6.7	....	....
Bowling Green	10,000	Ri.	No	Chl	850,000	85	No	2,802	310	11	2 3c	6c	12.00
Burnside (P)	1,200	Ri.	No	Hyp	50,000	42	No	175	25	14	5c	15c	18.00
Covington	*57,121	Ri.	No	Chl	4,300,000	75	No	10,500	10,500	100	24c	13.3c	8.00
Cynthiana	,00	Ri.	No	No	140,000	35	No	00	30	4	20c	8c	15.00
Danville	7000	Ri.	Yes	Chl	928,000	133	Yes	1,67	1,067	100	67c	27c	60c
Fulton (P)	8,00	W.	No	No	400,000	50	No	1,335	10	1	30c	7.5c	......
Greenville	2.000	L.	No	No	200,000	100	No	239	180	75	40c	40c	18.00
Hickman (P)	3,500	W.	No	No	400,000	114	No	569	172	30	......	......	......

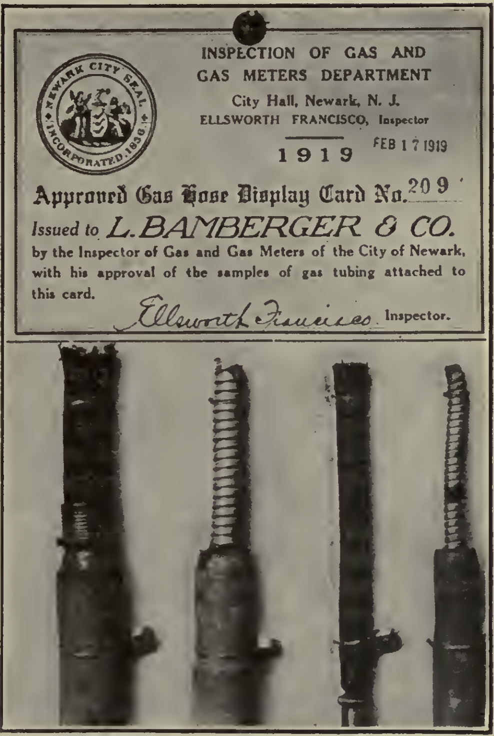
Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal	Lowest Commercial per 1,000 gal	Minimum Annual Charge
KENTUCKY—(Cont.)													
Hopkinsville (P)	10,000	Imp.	Yes	Chl	500,000	50	No	2,265	1,300	57	30c	10c	$6.00
Lexington	*41,534	Imp.	Yes	Yes	3,750,000	91	No	8,460	7,980	95	25c	9c	6.00
Louisville (P)	*234,891	Ri.	Yes	Chl	32,500,000	138	Yes	47,645	5,900	12	10c	4c	......
Middlesboro (P)	9,000	L.	No	No	1,000.000	111	No	1,240	533	43	30c	5c	12.00
Mt. Sterling (P)	6,000	L.	Yes	No	400,000	67	No	759	759	100	40c	25c	12.00
Paris (P)	8,000	Ri.	Yes	Chl	800,000	100	No	1,200	45	4	25c	16c	15.00
Shelbyville (P)	4,000	Cr.	Yes	Hyp	300,000	75	No	578	578	100	30c	10c	12.00
Somerset (P)	6,000	Cr.	No	No	500,000	83	No	1,224	590	48	50c	50c	12.00
LOUISIANA													
Alexandria	*17,500	W.	No	.....	1,000,000	57	...	2,000	2,000	100	40c	12c	$12.00
New Iberia	7,000	W.	Yes	Hyp	500.000	72	No	300	200	67	20c	12c	12.00
New Orleans	*387,408	Ri.	Yes	Yes	38,000,000	98	Yes	55,000	55,000	100	10c	7c	3.00
Patterson	3,700	Ri.	Yes	No	150,000	41	No	150	150	100	30c	5c	......
Shreveport	*43,874	Ri.	Yes	Chl	4,356,090	100	No	5,300	4,300	81	25c	8c	7.80
Washington	1,000	W.	No	No	15,000	15	No	90	90	100	50c	12.5c	......
MAINE													
Auburn	17,000	L.	No	No	Unknown	....	No	2,600	72	3	10.7c	4c	......
Bangor	*25,978	Ri.	Yes	No	3,897,407	150	No	5,311	94	2	33.3c	26.7c	$12.00
Biddeiord, etc. (P)	28,000	Ri.	Yes	No	2,000,000	72	No	4,342	900	21	26.7c	9.3c	16.00
Boothbay Harbor	....	P.	No	No	400,000	....	No	849	12	14	33.3c	......	......
Brewer (P)	6,000	Ri.	Yes	Chl	15,000	25	Yes	1,556	35	2	33.3c	8c	6.00
Brunswick and Topsham	9,000	W.	No	No	520,000	58	No	1,290	1,164	90	33.3c	8c	8.00
Houlton (P)	7,000	Br.-Sp	No	No	750,000	107	No	1,350	8	6	35c	10c	......
Lisbon Falls	4,000	W.	No	No	150,000	38	No	500	400	80	33.3c	13.3c	7.00
Pittsfield	3,500	W.	No	No	350,000	100	No	578	60	10	33c	9c	None
Richmond	2,000	Ri.	No	Chl	175,000	88	No	300	10	3	33.3c	10.7c	18.00
Rumford	7,000	Imp.	No	No	500,000	72	No	800	150	19	33.3c	14.7c	12.00
Skowhegan	4,500	Sp.	No	Chl	350,000	78	No	875	240	27	30c	10c	None
South Paris	2,000	Br.-Sp	No	No	150,000	75	No	300	10	3	20c	9c	None
Stockton Springs (P)	800	P.	No	No	Unknown	....	.....	165	3	2	30c	7.5c	40.00
Waterville	*13,351	L.	No	.....	3,392,523	252	Yes	3,385	70	2	25c	25c	40.00
MARYLAND													
Annapolis	*11,214	W.-St.	No	Chl	1,036,655	93	No	2,750	90	3	15c	15c	$4.00
Baltimore	*733 826	Ri.	Yes	Chl	120,000,000	164	Yes	138,000	Commer.	....	......	8.7c	......
Camoridge	7,900	W.	No	No	1 000 000	127	No	1 800	125	7	35c	18c	12.00
Chestertown	2,500	Sp.	No	No	160 000	64	Yes	650	75	12	30c	30c	12.00
Cumberland	*29,837	L.	Yes	Chl	7 000 000	235	Yes	6,000	1 000	17	7c	5c	8.00
Hagerstown	*28,066	St.	No	No	4.000,000	143	Yes	5,600	5,200	93	30c	8c	6.00
Hyattsville	50,000	St.-W.	Yes	Chl	1,000.000	20	No	2,000	1,500	75	12c	10c	4.00
MASSACHUSETTS													
Adams	14,000	W.	No	No	1,500,000	107	No	1,100	75	7	10c	10c	......
Andover	8,301	L.	No	.....	598,027	72	No	1,521	1,370	90	30c	7c	$6.00
Athol	9,792	Res.	Yes	No	1,000,000	102	Yes	1,500	90	6	$2.50	5c	......
Attleboro	*19,731	W.	Yes	No	1,137,000	58	Yes	3,072	2,975	97	30c	8c	8.00
Belmont	9,700	Res.	No	No	564,000	58	Yes	1,764	1,764	100	20c	......	6.00
Billerica	3,646	W.	No	No	348,990	96	No	627	623	99	33.3c	18c	6.00
Braintree	*10,554	P.	No	No	637,423	60	No	2,570	2,133	83	36c	20c	6.00
Brookline	*37,748	W.-I.G	Yes	No	3,600,000	96	No	5,971	5,971	100	16c	16c	None
Brockton	*66,138	L.	No	No	3,240,000	49	No	9,930	9,950	100	25.3c	13.3c	......
Cambridge	*109,694	P.-Br.	No	Chl	10,903,000	100	Yes	14,000	6,600	47	10c	10c	5.00
Chelsea	*43,184	Imp.	No	No	3,158,400	73	Yes	5,208	5,208	100	14.7c	14.7c	6.00
Chicopee	*36,214	Imp.	No	No	2,100,000	58	Yes	3,700	2,855	77	20c	10c	7.00
Clinton	13,100	Imp.	No	No	762,858	58	Yes	1,945	1,712	88	33.3c	8.6c	5.00
Danvers	12,000	P.	No	No	1,402,900	117	No	2,579	150	6	25c	13c	......
Everett	*40,120	Res.	No	No	2,886,700	72	Yes	6,318	4,056	64	16.7c	10.7c	6.00
Fairhaven (P)	6,000	W.	No	No	400,000	67	Yes	1,400	1,400	100	36c	20c	......
Fall River	*120,485	L.	No	No	5,926,945	49	Yes	10,382	10,383	100	28c	10c	None
Falmouth	4,000	P.	No	No	400,000	100	No	1,500	25	2	None	24c	10.00
Fitchburg	*41,013	Br.-P.	No	No	4.500,000	110	.....	5.900	5,200	90	24c	5.3c	5.00
Framingham	*16,785	Imp-I.G	No	Chl	950,194	57	Yes	2,799	2,672	96	33.3c	12c	6.00
Gilbertville (P)	2,300	W.	No	No	Unknown	....	No	225	28	12	$1.50	90c	6.00
Haverhill	*53,884	P.	No	No	5,690,531	106	No	8,351	3,642	44	21.3c	10c	10.00
Hudson	9,000	P.	Yes	No	400,000	44	No	1,357	1,357	100	$2.50	65c	5.00
Lawrence	*94,270	Ri.	Yes	No	4,430,100	47	No	8,685	8,234	95	24c	24c	8.00
Leominster	*19,745	Imp.	No	No	2,000,000	101	No	32,000	2,800	9	18.6c	2.7c	5.00

Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal	Lowest Commercial per 1,000 gal	Minimum Annual Charge
MASS.—(Continued)													
Lenox (P)	3,170	Res-Sp.	No	No	290,000	92	Yes	319	400	100	35c	35c	$15.00
Lexington	6,340	Res.	No	No	390,000	62	No	1,310	1,310	100	29c	20c	12.00
Littleton	1,300	W.	No	No	45,000	35	No	234	234	100	50c	10c	12.00
Lowell	*112,759	W.	Yes	No	6,711,721	60	No	14,199	12,445	88	28c	28c	10.50
Lynn	*99,148	Res-Ri	No	No	9,000,000	91	Yes	15,000	8,900	59	20c	17.5c	10.00
Mansfield	6,000	W.	No	No	600,000	100	No	1,200	750	63	33.3c	5c	10.00
Maynard	7,000	P.	No	No	330,555	47	No	1,130	1,124	99	50c	13.3c	6.00
Medway	3,000	W.	No	No	150,000	50	No	551	250	45	40c	20c	12.00
Millbury (P)	6,000	W.	No	No	300,000	50	No	575	415	72	45c	25c	......
Milton	9,824	Imp.	Yes	No	401,300	41	No	2,116	2,166	100	33.3c	33.3c	......
Monson	4,000	W.	No	No	340,000	85	No	512	250	49	30c	8c	6.00
Natick	11,290	W.	No	No	700,000	62	No	2,722	2,304	85	25c	15c	5.00
New Bedford	*121,217	P.	No	No	9,650,557	80	No	16,020	15,364	96	15c	10c	5.00
Newburyport	*15,609	W.-Sp.	No	No	1,244,000	80	No	3,785	100	3	20c	14c	......
North Adams	2,300	Br.	No	No	3,000,000	130	No	3,322	250	8	14.7c	6.7c	6.00
Northampton	*21,950	St.	No	No	2,750,000	125	No	4,000	137	3	......	6c	......
North Andover	6,000	P.	No	No	364,089	61	Yes	1,170	1,081	93	$2.00	80c	6.00
North Attleboro	9,500	W.	No	No	500,000	53	No	1,450	1,482	100	60c	15c	......
Oxford (P)	4,000	W.	No	No	....	....	No	757	340	45	48c	10c	12.00
Peabody	*19,552	P.	No	No	4,000,000	204	No	3,200	2,500	78	20c	20c	5.00
Quincy	*47,876	Imp.	No	No	4,543,000	95	No	10,830	10,100	94	33c	14c	8.00
Reading	7,200	W.-I.G	Yes	Lime	290,000	40	No	1,775	1,730	97	46.7c	20c	......
Revere	*28,823	Res.	No	No	1,500,000	52	Yes	4,800	3,800	79	20c	15c	10.00
Salem	*42,529	L.-Ri.	No	Chl	5,305,000	126	Yes	11,039	547	50	20c	20c	3.00
Sharon	2,400	W.	No	No	240,000	100	No	575	121	21	40c	25c	20.00
Somerville	*93,091	Res.	No	No	6,541,500	70	Yes	13,544	10,322	76	16c	11.7c	6.00
So. Hadley Falls	5,000	Imp.	No	No	300,000	60	No	625	65	10	15c	10c	6.00
Spencer	....	P.	No	No	Unknown	....	No	894	824	92	20c	5c	4.00
Springfield	*129,563	Res.	Yes	No	11,920,000	103	Yes	15,560	15,264	98	30c	7c	None
Swampscott	6,200	Imp.	No	No	570,900	92	No	1,990	1,990	100	33.3c	18c	6.00
Taunton	*37,137	P.	No	No	3,090,038	83	No	6,013	3,902	65	25c	9c	6.00
Tisbury	2,400	Sp.	No	No	50,000	21	No	500	10	2	50c	33.5c	50.00
Turner s Falls	7,500	L.	No	No	765,000	102	Yes	670	45	7	15c	7.5c	None
Walpole	6,000	W.	No	No	1,020,720	170	No	1,152	937	81	30c	10.5c	12.00
Waltham	*30,915	W.	No	No	1,952,100	63	Yes	4,374	4,159	95	27c	15c	5.00
Watertown	23,000	Imp.	No	No	2,002,900	87	Yes	3,330	3,471	100	25c	10c	10.00
Wellesley	8,000	W.	No	No	521,000	65	No	1,721	1,721	100	37.5c	25c	......
Weymouth	*15,057	P.	No	No	1,200,000	80	Yes	4,155	2,100	51	40c	9c	4.00
Whitman	7,310	L.	Yes	No	227,000	31	Yes	1,489	1,204	87	30c	15c	7.20
Winchendon	6,000	W.	No	.....	225,000	38	No	1,060	1,025	97	40c	13.3c	8.00
Winthrop	*15,446	Res.	No	No	792,000	51	Yes	2,983	2,983	100	20c	20c	10.00
Worcester	*179,754	Imp.	No	No	14,268,000	80	Yes	21,937	21,118	96	20c	10c	4.00
Uxbridge	5,400	W.	No	No	255,000	47	No	541	456	84	30c	30c	10.00
MICHIGAN													
Adrian (P)	*11,878	Cr.	Yes	Chl	1,500,000	126	No	2,600	184	7	20c	10c	$10.00
Battle Creek	*36,164	L.-W.	No	Chl	3,500,000	97	Yes	9,250	7,800	84	13c	4c	3.00
Bay City	*47,554	B.	No	Chl	9,000,000	190	No	7,500	6,000	80	10c	5c	6.00
Boyne City	....	W.-Sp.	No	No	500,000	....	No	900	210	23	15c	7c	6.00
Charlevoix	2,500	L.	Yes	No	525,000	210	Yes	1,000	1,000	100	25c	20c	5.00
Dowagiac	5,500	W.	No	No	500,000	91	No	1,300	1,300	100	20c	8c	6.00
Fennville	500	W.	No	No	80,000	160	No	150	150	100	20c	20c	6.00
Harbor Springs	1,700	W.	No	No	200,000	118	No	850	420	49	30c	18c	7.20
Highland Park	*46,499	L.	No	Chl	12,500,000	269	Yes	7,000	2,800	54	70c	49c	5.00
Holland	*12,166	W.	No	No	912,288	75	Yes	2,630	2,636	100	13.3c	5.3c	3.00
Homer	1,100	W.	No	No	100,000	91	No	250	225	90	20c	8c	5.00
Iron Mountain	10,000	W.-L.	No	Chl	600,000	60	No	1,671	668	40	30c	8c	5.00
Jackson	*48,374	W.	No	Chl	5,000,000	103	No	10,000	10,000	100	13.3c	10c	7.20
Lansing	*57,327	W.	No	Chl	6,000,000	105	No	12,175	11,975	98	16c	8c	7.80
Ludington	10,000	L.	No	Hyp	1,500,000	150	No	2,000	1,900	95	13.3c	8c	6.00
Manistee	10,000	W.	No	No	850,000	85	No	2,300	1,350	59	13.5c	9c	6.00
Manistique	6,500	Ri.	No	Chl	800,000	123	No	1,000	16	2	35c	5.5c	......
Marquette	*12,718	L.	No	Chl	2,500,000	197	Yes	2,400	1,350	56	13.3c	4c	5.40
Monroe (P)	*11,573	L.	No	Chl	2,200,000	190	No	2,800	1,880	67	45c	9c	8.00
Mt. Clemens	10,000	W.	No	.....	1,500,000	150	No	3,000	2,140	71	17.3c	10.7c	6.00
Niles	7,500	W.	No	Chl	800,000	107	No	1,700	1,500	88	21.3c	8.4c	6.00
Paw Paw	1,800	W.	No	No	250,000	139	No	475	475	100	18c	12c	2.50
Rochester	3,000	W.-Sp.	No	No	Unknown	....	No	665	519	78	12c	6.7c	4.00

Municipality	Population	Source of Supply	Filtered	Sterilized	Consumption		Metered at Pump	Number of Services	Number of Meters	% Metered	Meter Rates		
					Average Daily	Per Capita					Highest Domestic per 1,000 gal	Lowest Commercial per 1,000 gal	Minimum Annual Charge
MICH.—(Continued)													
Saline............(P)	2,000	......	No	No	120,000	60	No	250	24	10	8c	7.5c	......
Saginaw............	*61,903	Ri.	No	No	17,000,000	276	No	13,000	400	3	11c	4c	$10.00
St. Joseph............	....	L.	No	Chl	800,000	....	No	1,500	1,400	93	35c	20c	10.00
Schoolcraft............	900	W.	No	No	25,000	278	No	100	100	100	25c	10c	6.00
St. Clair............	3,250	Ri.	No	Chl	700,000	215	No	850	12	1	12.5c	5c	......
Sturgis............	6,000	W.	No	No	1,000,000	167	No	1.577	1,577	100	14c	8c	4.80
Traverse City.........	13,000	B.	No	Chl	2,500,000	192	No	2,530	1,400	55	88c	4c	7.00
Wayland............	1,000	W.	No	No	50,000	50	No	192	150	78	30c	20c	5.00
MINNESOTA													
Appleton............	1,600	W.	No	No	60,000	37	Yes	275	275	100	30c	30c	2.00
Bemidji............	8,000	W.	No	No	200,000	25	Yes	540	540	100	30c	20c	10.00
Breckenridge.........	2,500	Ri.	Yes	No	20,000	8	No	500	30	6	33.3c	4c	......
Brooten............	800	W.	No	No	10,000	13	No	55	55	100	25c	25c	......
Chisholm............	9,000	Mine	Yes	Chl	900,000	100	Yes	1,231	436	35	15c	15c	6.00
Duluth............	*98,917	L.	No	Chl	8,500,000	86	Yes	16,346	12,706	78	20c	10.7c	6.00
Ely............	5,000	L.	Yes	Yes	400,000	80	Yes	660	630	95	33.3c	6.7c	7.80
Harmony............	1,000	W.	No	No	25,000	25	No	160	3	2	$1.00	25c	......
Jordan............	1,300	W.	No	No	15,000	11	Yes	30	30	100	40c	20c	5.40
Little Falls........(P)	6,500	Ri.	No	Chl	600,000	92	No	450	250	56	30c	4c	6.00
Minneapolis.........	*380,498	Ri.	Yes	Chl	36,000,000	95	Yes	60,000	60,000	100	8c	8c	......
New Prague.........	1,600	W.	No	No	40,000	25	No	146	146	100	50c	20c	9.00
Northfield.........	3,650	A.W.	No	No	220,000	60	No	660	660	100	20c	7.3c	6.00
Ortonville.........	2,500	W.	No	No	100,000	40	No	420	420	100	40c	10c	8.00
Owatonna.........	8,000	W.	No	No	431,349	54	Yes	1,239	625	51	30c	8c	6.00
Redwood Falls........	2,600	Sp.	No	No	40,000	15	No	525	525	100	40c	13.3c	3.00
St. Paul............	*234,595	L.	No	Chl	18,000,000	77	Yes	41,589	38,506	93	8c	8c	3.60
Wanda............	200	W.	No	No	3,000	15	No	30	30	100	50c	45c	7.50
Winthrop............	1,300	W.	No	No	20,000	15	Yes	90	90	100	30c	15c	6.00
Wolverton............	200	W.	No	No	1,000	5	No	20	20	100	50c	50c	6.00
Zimbrota............	13,000	W.	No	No	40,000	3	No	......	180	....	25c	20c	......
MISSISSIPPI													
Armory............	3,500	W.	No	No	300,000	86	No	402	402	100	35c	20c	18.00
Canton............(P)	3,300	W.	No	No	150,000	46	No	700	700	100	26c	10c	6.00
Clarksdale............	11,000	W.	No	No	Unknown	....	No	1,400	1,350	97	30c	8c	9.00
Jackson............	*22,679	Ri.	Yes	Chl	3,200,000	141	Yes	3,900	2,500	64	26.7c	10.7c	12.00
New Albany.........	3,000	W.	No	No	100,000	33	No	400	350	88	37.5c	25c	12.00
Okotona............	3,500	W.	No	No	100,000	28	No	350	275	79	50c	25c	18.00
Pascagoula.........	8,000	W.	No	No	250,000	31	No	600	220	37	40c	15c	12.00
MISSOURI													
Bloomfield............	1,200	W.	No	No	15,000	12	No	93	93	100	62.5c	62.5c	15.00
Bolivar............	2,000	W.-Sp.	No	No	60,000	30	No	400	360	90	50c	30c	6.00
Carrollton.........(P)	3,600	Cr.	Yes	No	300,000	84	No	650	600	93	40c	10c	12.00
Chillicothe............	7,500	Ri.	Yes	No	500,000	67	No	1,350	1,130	84	40c	8c	9.60
Concordia............	1,050	W.	No	No	20,000	20	No	......	......	....	50c	40c	......
Farmington............	3,000	W.	No	No	432,000	144	.....	450	450	100	33.3c	26.7c	1.25
Fayette............	4,000	L.	No	No	100,000	25	No	300	200	67	1.00	40c	1.25
Jefferson City......(P)	*14,067	Ri.	No	No	1,500,000	107	No	1,867	1,867	100	32c	13.3c	4.80
Joplin............(P)	*29,855	Cr.	Yes	Chl	4,000,000	134	Yes	7,000	3,000	43	35c	8c	12.00
Palmyra............	2,068	Sp.-Ri.	Yes	Chl	100,000	48	No	231	124	54	35c	10c	6.00
Paris............	1,500	Ri.	Yes	No	120,000	80	No	245	245	100	40c	20c	6.00
Poplar Bluff.........	8,042	Ri.	No	No	800,000	99	No	1,800	100	6	25c	10c	6.00
Trenton............	6,951	Ri.	Yes	No	750,000	108	No	1,200	1,200	100	53.3c	9.3c	9.00
Unionville............	2,000	L.	No	No	Unknown	....	No	144	100	70	50c	50c	12.00
Washington............	4,500	W.	No	No	350,000	78	No	425	325	76	40c	9c	9.60
MONTANA													
Billings............	*15,100	Ri.	Yes	Chl	2,617,554	173	Yes	3,452	3,452	100	33.3c	6.7c	1.00
Bozeman............	8,000	Cr.	No	Chl	2,000,000	250	No	1,500	52	3	$1.00	10.7c	......
Havre............	6,000	W.	No	No	800,000	133	No	850	300	35	30c	12c	5.00
Kalispell............	6,147	Sp.	No	No	1,500,000	244	Yes	1,250	980	78	40c	7.5c	12.00
Missoula..........(P)	12,869	Res.	.....	Chl	12,000,000	94	Yes	3,450	214	6	34.7c	8c	15.00
NEBRASKA													
Albion............	2,000	W.	No	No	24,000	12	No	404	400	99	25c	25c	4.00
Ashland............	1,800	W.	No	No	80,000	45	Yes	600	60	10	35c	15c	3.00
Aurora............	3,500	W.	No	No	59,216	17	No	8,500	750	87	1.25	15c	......
Beaver City.........	1,500	W.	No	No	20,000	13	No	286	250	88	15c	15c	10.00
Bethany............	1,200	W.	No	No	25,000	21	No	200	200	100	25c	15c	6.00

Flexible Gas Tubing Regulations in the City of Newark, N. J.

By Ellsworth Francisco
Inspector of Gas and Gas Meters, Newark, N. J.



INSPECTION OF GAS AND
GAS METERS DEPARTMENT
City Hall, Newark, N. J.
ELLSWORTH FRANCISCO, Inspector
1919 FEB 17 1919

Approved Gas Hose Display Card No. 209
Issued to L. BAMBERGER & CO.
by the Inspector of Gas and Gas Meters of the City of Newark, with his approval of the samples of gas tubing attached to this card.
Ellsworth Francisco Inspector.

GAS HOSE APPROVAL CARD FOR MERCHANTS

THE increasing number of accidents directly chargeable to the use of flexible gas tubing in recent years in Newark, often with fatal results, caused our governing officials to adopt on March 13, 1917, a municipal ordinance prohibiting the sale and use of other than approved gas tubing. The purpose and intent of this ordinance is to prevent the sale and use of all kinds of unsafe gas tubing and to promote greater safety and freedom in the use of gas appliances requiring tubing connections. This ordinance simply provides that "it shall be unlawful for any person, persons, firm, or corporation to use, sell, expose, or offer for sale, to install or affix, in the city of Newark any tubular connections or fabric intended for any illuminating-gas fixture, stove, heater, lamp, or other gas appliance, unless such tube connection, hose, or similar device shall have been approved by the Inspector of Gas and Gas Meters of the city of Newark," and makes it the duty of five city departments to coöperate in enforcing the regulations established by the Inspector of Gas and Gas Meters. The standards and regulations established by the Bureau for Inspection of Gas and Gas Meters under the authority given by this ordinance follow almost exactly recommendations made by the Federal Bureau of Standards, to which we are indebted for much valuable aid.

The preliminary examination of all kinds of gas tubing being offered for sale throughout the city showed that a very large majority of the merchants were mainly selling a "covered" tubing that depended chiefly upon layers of paper to make it gas-tight. Large quantities of a particularly cheap type of this kind of tubing known as "competition" tubing was being sold by 5- and 10-cent stores.

Since the serious danger from the use of paper tubing is perfectly obvious, this with its several variations is unqualifiedly disapproved. Tubing with a wall of gelatine compound less than 1/32 of an inch thick, common rubber and pure gum hose (the kinds usually used for syphoning purposes) and rubber made for use as gas hose without an outside coating of gelatine compound are also prohibited from sale. Defective tubings of all kinds are absolutely condemned, and uncovered rubber tubing made similar to garden hose with layers of canvas incorporated between the layers of rubber is approved for industrial purposes only. All other kinds of tubing intended to convey gas are approved until further notice.

We do not permit any retail dealer to attach or sell rubber end pieces separate from the tubing or to handle tubing in quantity lots uncut in lengths without the rubber end pieces already attached. This rule was found to be necessary because merchants who handled these rubber tips either attached them in a very careless manner or sold them to the customer, who had no knowledge of attaching them. The result in either case was often a serious accident either from fire or asphyxiation.

Each merchant is held responsible for the condition of the tubing he sells; therefore, as a measure of protection to his customers as well as himself, we require him to make, at the time he sells a piece of tubing, a strength, rubber end and leak test and a complete examination for defects that render the tubing unsafe for use.

Every merchant who desires to sell gas tubing, whether retail or wholesale, is required to obtain annually, without charge from the Bureau, a permit issued in the form of a public display card. This card bears, along with the printed matter, the merchant's name and address, an identifying number and the date issued, and attached to the lower half is a sample of each kind of approved tubing which the merchant desires to sell. No kind of gas tubing other than the samples approved on the permit card can be carried in stock or offered for sale at any time. This permit card must be publicly displayed beside the merchant's tubing stock.

The first permit cards were issued from the office of the Bureau, the merchants being required, through a notice, to come in for them. This was done so that it would be possible to get in personal touch with each merchant and secure his undivided attention, and to explain to him the purpose and intent of the ordinance and regulations. In this way his coöperation and goodwill were obtained, both of which have been a valuable aid to the success of our work. The citizens of the city were made acquainted with the ordinance and regulations established thereunder through newspaper articles, exhibits and demonstrations, talks to public school classes, and the requirement that merchants publicly display their permit cards.

A great quantity of disapproved gas tubing in the hands of merchants was confiscated within a reasonable time after the ordinance and regulations became effective. A special corps of inspectors went out on a search for this stuff and found it under counters, in cellars, back rooms, and in some cases on the regular tubing rack still being offered for sale contrary to law. The city is now entirely free of this menace of cheap and dangerous gas tubing as far as the storekeepers are concerned. While vigilance will always be necessary, the Bureau is now devoting a good part of its attention to an effort to get householders to realize the serious dangers arising from the use of their old pieces of tubing in connection with housekeeping equipment.

The Booster Pumping Station of Bayonne, N. J.

THE success of the Booster pumping station of Bayonne, N. J., has brought great satisfaction to the residents of that city. House owners and tenants in many sections of the city had become so accustomed to the dribbling flow in the upper floors of their homes or apartments that they had practically given up thought of any immediate change. In many of these homes, the bathrooms had ceased to exist as lavatories years ago and had gradually become storage rooms for household junk. But with the completion of the Booster pumping station in the latter part of August, 1919, this state of affairs ceased to exist.

The water-supply, which was formerly delivered under approximately 5 pounds per square-inch pressure, is piped from Arlington, N. J., and enters the station through a 32-inch intake pipe. Two Worthington centrifugal pumps of 9,000,000 gallons daily capacity perform pumping duty. These pumps are driven by two 150-horsepower, 1,150-revolutions per minute Westinghouse motors, and an increase in pressure to approximately 34 pounds per square inch is obtained. An additional pump of 15,000,000 gallons per day capacity and a motor of 250 horsepower, 900 revolutions per minute, will be installed soon.

The water leaves the station through a 20-inch main. There is no reservoir, the function of increasing the pressure being performed directly by the pumps.

Electrical energy is supplied at 2-phase, 2,200 volts, alternating-current, and, by means of a transformer, this current is converted to 440-volt, three-phase energy, so that standard three-phase motors can be used.

An interesting feature of this installation is the graphic record of the pump and motor performance. Crosby gauges indicate the water pressure, and two pitometers show the amount of water pumped daily. In addition, a graphic meter makes a permanent and continuous record of the exact amount of current used. As is evident, the performance can be readily checked at any time. Deviations in the curve lines show irregularities, so that immediate correction can be made, thus increasing the efficiency of the plant and eliminating the worry attendant on unknown troubles.

EXTERIOR OF BOOSTER PUMPING STATION, BAYONNE, N. J.

INTERIOR OF STATION, SHOWING PUMPS AND GAUGES

As shown by the illustration, the building itself is an attractive brick structure. Lighting is provided by large drop lights, and all modern conveniences are evident, including a shower-bath for the staff. These facilities add greatly to their comfort.

In the construction of this work, Clyde Potts, 30 Church Street, New York City, was consulting engineer.

Fire Prevention Worth Its Price

Fire prevention engineering is an exact science; a qualified inspector can go into any town or any building and readily detect the elements of hazard. He can suggest means by which these hazards may be corrected; he can make recommendations which, if carried out, would result in approximately total safety. It is far less expensive to have such inspections made and to carry out such corrective suggestions than to indulge in the expensive luxury of fire, which costs the nation more than 20,000 human lives each year and in excess of $900,000 per day. If this were an unavoidable expense we should have to endure it as best we might, but it is foolishly and shockingly unnecessary. Every cent expended in rational fire prevention is worth while.

Street Cleaning in Montgomery, Ala.

By H. A. Washington

City Engineer

IN December, 1919, the city of Montgomery purchased a motor pick-up sweeper in order to be better able to handle the street cleaning problem in the down-town district. The machine has been in operation almost constantly in the business section of the city at night, and during the day in the residential section. It has given entire satisfaction, as it is economical to operate and at the same time thoroughly cleans the streets in a sanitary manner. The sprinkler attachment in front of the broom allows sufficient time for the water to penetrate the dirt and thus eliminate dust.

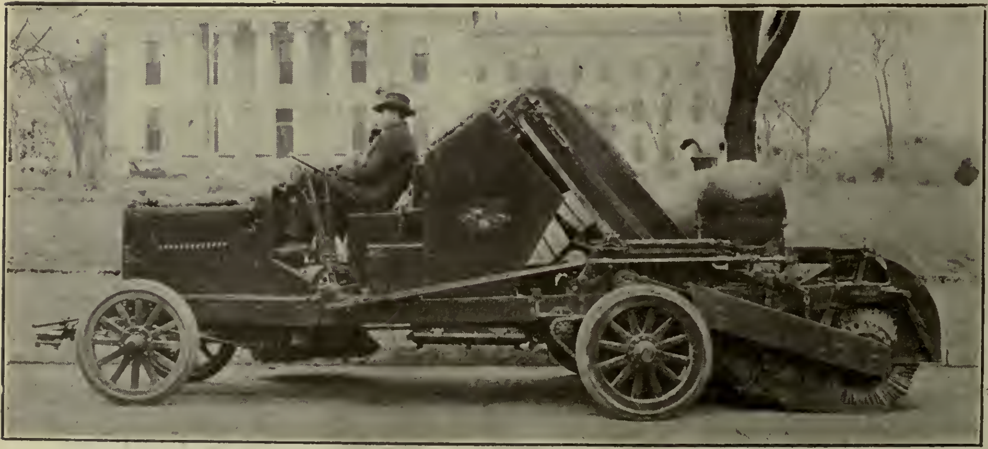
The cleaning capacity of this sweeper, as claimed by the makers, the Austin Manufacturing Company, is 16,000 square yards per hour when operating at the rate of 4 miles per hour, and 32,000 square yards per hour when operating at 8 miles per hour. In operation in Montgomery, the best results were secured when operating at about 6 miles per hour, and at that rate the capacity claimed for the machine has been exceeded.

The labor necessary for the machine consists of a driver and a low-priced negro helper. The gasoline consumption varies from 1 to 1¼ gallons per hour. Instead of having the machine go to one of the city dumps when the hopper is full, places have been designated where the material from the hopper is dumped and then loaded into carts and hauled away. By means of this machine it has been possible to eliminate the 3 horse-drawn sweepers which were previously used, together with 6 mules, 6 drivers, feed, etc, making decided financial gains for the city.

The machine weighs about 7,000 pounds, is 9 feet 9 inches wide and 19 feet 3 inches long. The broom is 36 inches in diameter and is 7 feet long, and split bamboo is used for the filler, requiring about 175 pounds of filler for each broom. The Montgomery machine is equipped with a gutter broom attachment which very efficiently sweeps all dirt out of the gutter and into the path of the main broom. This attachment has proved one of the most important parts of the machine.

The equipment for sprinkling consists of a supply tank of 150 gallons capacity, from which the water flows by gravity to a force pump. The spray nozzles are placed before the front wheels, and the nozzles are protected from clogging by means of separate strainers.

The steel hopper has a capacity of 2 cubic yards and is dumped by the driver by means of a lever handy to the driving seat.



THE PICK-UP SWEEPER USED BY THE CITY OF MONTGOMERY, ALA.

Resurfacing Worn-out Macadam With Asphalt

Buncombe County, N. C., Fights Mud With Improved Roads

By E. P. Sams

County Highway Engineer, Buncombe County, N. C.

SEVERAL years ago, Buncombe County had what was considered at that time a fairly good system of water-bound macadam roads radiating out through the leading sections of the county from Asheville, which is the county-seat. This type of road, while dusty and noisy, was a very great improvement upon the one common just prior to this period—the mud or "Tar Baby" type. The writer can well recall the sight of the farmer with his lightly loaded wagon, drawn by four and often six strong horses pulling through clay mud up to the axle. He certainly made an heroic effort to reach market with his farm products! Even then he was compelled to stop every few feet along the way in order to let his team "blow." On reaching the city,—if, indeed, he was fortunate enough to accomplish his purpose,—it was to find that he and his team alike were mud-covered and exhausted, and his morale seriously impaired. This is not overdrawn in the least. Twenty years ago this was a very common spectacle on any of our then leading roads!

Little wonder that the macadam road, with its many shortcomings, even when put down upon the original dirt or clay roadway with absolutely no regard for either grade or alignment, was looked upon as being a deliverer, for it really was insurance against the mud—that age-old handicap to transportation and civilization.

Just about the time that we felt secure in water-bound macadam, a new and very serious problem was thrust upon us by the coming of the automobile, not to mention the heavy truck, with its ever-increasing capacity and weight.

The effect of this change in modes of transportation upon our boasted but already worn macadam roads was to rapidly disintegrate and ruin them. For, as a matter

THIS RESURFACED MACADAM PAVEMENT EXTENDS FROM BILTMORE STATION, ASHEVILLE, N. C., TO THE BEGINNING OF THE CONCRETE HIGHWAY of fact, intensive auto traffic will soon ravel the best macadam road, being particularly disastrous on steep grades and sharp curves.

Not being able to put concrete or asphalt with concrete base upon all these roads, the proposition with us was to rebuild these old worn-out macadam roads in some practical, economical way.

A Practical Method

After much experimenting and investigating, Buncombe County adopted the following method of reconstruction on these old macadam roads, which seems to be about the best solution of the problem for us: Build a cement concrete curb or header on each side of the old macadam. For this a 1:2:4 mixture is used and an expansion joint inserted about every 25 feet. After this is done, the old macadam is scarified and sufficient new crushed stone and screenings are added to make a depth of from 6 to 8 inches, after being thoroughly rolled and compacted. For the scarifying work we use a heavy "Porcupine" scarifier. The job is entirely too heavy for a team, so we attach this machine to an ordinary 16-ton road roller, which handles it nicely.

The curb or header is constructed so that it protrudes 2 inches above the base when completed and ready to receive the wearing surface.

For the wearing surface we use some of the various types of asphaltic construction—asphalt macadam, sheet asphalt, Topeka mix, etc. They are applied, of course, while hot, and then thoroughly rolled or ironed out with a light tandem roller to a compacted depth of 2 inches. This brings the wearing surface up flush with the headers on either side.

Where asphalt macadam is used for the wearing surface we apply a final thin seal coat of hot asphalt. Over this is applied a very thin layer of limestone "squeegee." Then a final rolling is given, and the job is complete. The main object in applying this layer of squeegee is to prevent the picking up of the seal coat by the wheels of traffic. Where sheet or Topeka asphalt is used for the wearing course, this seal coat is not necessary, as the surface of these types of asphalt is less porous and much more impervious to water. However, we "broom" the surface of these with a thin cement grout.

After five years of experience with this type of road, we find that by far the most important precaution to be exercised in its construction is to make sure of a good firm base, for the road is sure to prove just as satisfactory or as unsatisfactory as the base upon which it is laid.

Probably the greatest fault to be found with this road is that it becomes very slippery for team traffic in freezing weather. On the contrary, it has very many commendable features. Foremost among these is the fact that it can be so simply and easily repaired by cutting out defective spots and tamping or rolling in new material.

Being in a mountainous section, some very sharp curves are encountered on most of our roads. By giving increased width, often doubling the width at such points, and by elevating the outer edge of such curves, danger is brought to a minimum.

Illinois Traffic Demands Thicker Pavements

The evolution in highway specifications is, in view of the present traffic situation, an interesting study. In 1913 the plans of the Illinois Division of Highways called for concrete roads 6 inches thick laid on a crowned subgrade. Beginning with 1915, the Division built a flat subgrade, making the pavement 7 inches thick in the center and 6 inches on the sides. Conditions brought about by the war forced a heavy truck traffic, especially in the East, and demonstrated the fact that roads would be called upon to carry a much heavier burden than anticipated. Accordingly, the Illinois Federal Aid plans for 1919 specified pavements 7 inches in thickness at the side and 8 inches in the center. It was later realized that on the double-track pavement traffic was practically as great on the side of the road as in the center. The Division therefore decided upon another change and is now building all concrete pavements 8 inches thick throughout their entire width.

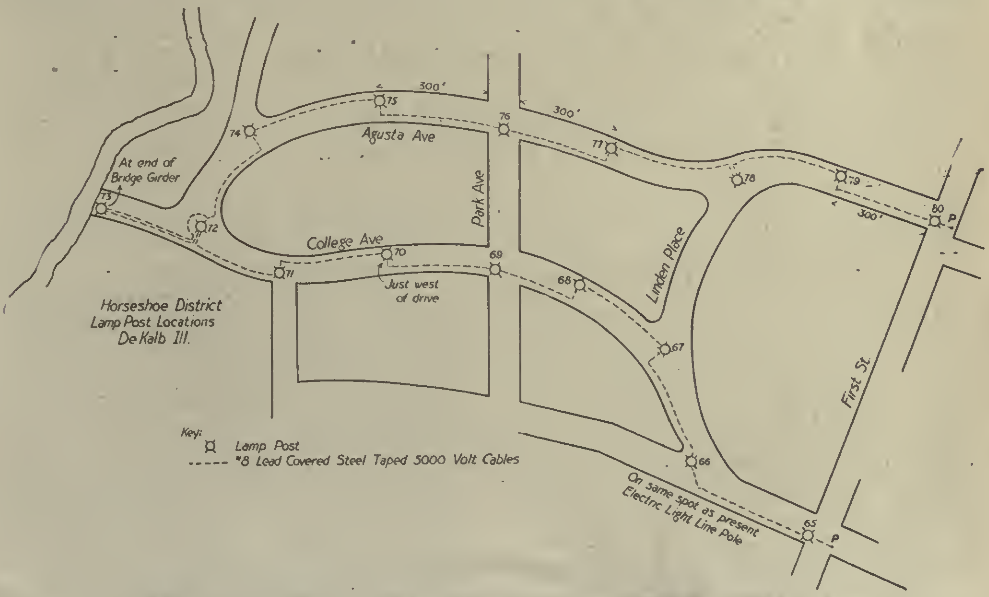
New Methods in Lighting a Residence District in DeKalb, Illinois

By J. R. Cravath
Illuminating Engineer

THE property owners in one of the best residence districts of DeKalb, Ill., several years ago decided to get together and put through a special assessment of their district for better street lighting. The district has winding streets rather heavily shaded, and the lighting conditions were anything but satisfactory. After some preliminary work by the property owners and A. R. Russell, public engineer of the city, the services of the author were secured to draw up plans. On account of the war, the actual installation was not made until recently.

This installation is rather unusual, in that it has ornamental posts located much farther apart than is, or has been, customary where such posts are employed. This necessitated the use of apparatus which has not been much used heretofore for this class of work, but which is likely to find a more extensive application in the future. On account of the limitations on the expenditure made by the property owners, and the block lengths of the district to be lighted, it was necessary to space the posts approximately 300 feet apart. A plan of the streets of the district, showing the location of the lamp-posts, is shown below. The other illustration shows the lamp-posts, and gives an idea of the character of the district.

There are sixteen lamp-posts in the district, all being of reinforced concrete with granite surface finish, made by the Chicago Concrete Post Company. The concrete shaft is 13 feet high. The novelty of the installation is in the post head, which has provisions for more efficiently utilizing the light than most of the post heads heretofore used, a point of special importance where the posts are spaced so far apart that the ordinary types of diffusing globes would give insufficient illumination on the street midway between posts. The post head used is the General Electric Company's Novalux Form 8, with a dome refractor for increasing the street illumination. This refractor is inside a stippled glass globe, which is pressed in three parts. The object of the refractor is to catch the light which ordinarily goes to illuminate



PLAN OF LIGHTING SYSTEM IN RESIDENCE DISTRICT, DEKALB, ILL.

TYPE OF LIGHTING STANDARD IN DEKALB, ILL.

the tree tops and refract or bend it down into directions such as to increase the illumination midway between lamps. The lamp used is a 250-candle-power, 2,500-lumen, gas-filled, series 6.6-ampere lamp.

The supply of electrical energy is through a series single conductor, steel-taped, No. 8, lead-covered, 5,000-volt cable, which is buried in the parkway just inside the curbing, 12 inches below the surface of the ground. Cables are carried direct from post to post without joints and terminated at the lamp receptacles. Current is supplied by the DeKalb Sycamore Electric Company on one of the same circuits which supplies ornamental lighting on Lincoln Highway, the principal business street. At a number of the triangular street intersections there are flower-beds in the middle of the street, and at such intersections the lamp-posts are placed in the centers of the flower-beds. At other points they are just inside the curbing. At point marked "P" on the plan, the underground lead-covered cable is brought up a pole of the electric light company and joined through a pothead to an overhead circuit. At each pothead a 5,000-volt lighting arrester is installed.

The work was carried out under regular special assessment proceedings under the Illinois laws, by the Board of Local Improvements. The work was done by Swanson Brothers, electrical contractors, of DeKalb. The cost of this improvement, figured on a cash basis, was equivalent to about $325 per post.

A Unique Catch-Basin at Erie, Pa.

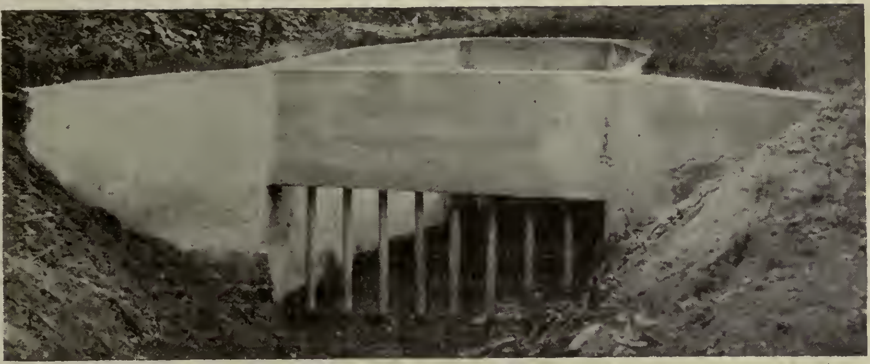
By Raymond Page

Former Civil Engineer in Charge, Kahkwa Park, Erie, Pa.

THE accompanying illustration shows an ingenious form of drift catch made solely of concrete. This drift catch is one of two similar drift catches which serve to protect from stoppage by branches, leaves and other debris a 40-inch concrete sewer, the main or trunk line of the storm-water sewer system at Kahkwa Park, a new addition to the city of Erie, Pa.

The sewer was constructed on a risky bottom in the bed of a creek at the bottom of a wooded ravine which nature had provided as a natural outlet for surface drainage from the surrounding plateau. Over this sewer a driveway has been constructed, at great expense, to accommodate vehicular traffic from the streets on the plateau to the low-lying beach of Presque Isle Bay, some two thousand feet distant from the entrance of the road. The damage which would be caused to this superimposed driveway and adjoining property by the stoppage of the storm-water sewer would be so great that no risk of such an occurrence at any time in the future could be taken. For this reason the engineer in charge of the subdivision designed a protective structure to be built entirely of reinforced concrete, so as to eliminate any possibility of decay, corrosion or rot.

The drift catches at Kahkwa Park are made wholly of reinforced concrete, even



A CATCH-BASIN MADE ENTIRELY OF CONCRETE, EVEN TO THE TRASH BARS, ERIE, PA.

to the rods. These rods were poured into forms made of 2-inch galvanized iron pipe which had been cut along their lengths into two hemispherical halves. The inside of the forms was treated with paraffine to prevent adhesion. These halves were then placed together, with a wooden block at the lower end made of 2-inch lumber, having a half-inch hole in the center for holding the reinforcing in place, and all was securely held together by metal straps. The reinforcing was then placed in position and held by means of the wooden block at the bottom and wires at the top. Then a mixture of 1:2:4 concrete was poured in and well rammed in place. Particular attention was given to grading the aggregates, up to particles passing through a ⅜-inch opening. After the forms had been removed, the rods were put in a shed and kept moist for twenty days, so that the best results would be obtained in setting.

When the forms for the side-walls, wing-walls, etc., of the catch-basin had been erected, the concrete rods were set and securely held in the places they were to occupy in the drift catch, and so placed that their upper and lower ends would be embedded 5 inches in the crown and apron respectively. Then the drift catch was poured in one running, thereby making it monolithic except for the rods. The mixture of this part of the drift catch was one part Portland cement, three parts sand and six parts gravel. The reinforcing throughout is ½-inch twisted iron bars set on 1-inch foot centers. The side-walls diverge at the entrance to the catch-basin to form wing-walls for retaining the adjoining soil banks of the ravine. The distance between parallel side-walls is 9 feet, height of wall 6 feet, and thickness 8 inches. The average thickness of the crown which holds the concrete rods is 7 inches. The apron, which is 6 inches thick, is constructed so that the top surface is 6 inches below the invert of the sewer, which arrangement allows for the collection of sand, etc.

This "Unpardonable Apathy" Still Persists in Some Cities

Cincinnati Was Bothered with it in 1819

From: "The Cincinnati Directory, containing the names, profession and occupation of the inhabitants of the Town." By a citizen. Published by Oliver Farnsworth, October, 1819. (Population at this time, 10,283, including 410 "persons of color.")

There are two engines owned by the Corporation, but, strange as it may seem, neither of them is kept in proper repair. A most unpardonable apathy on this subject pervades our citizens generally. Almost destitute of ladders, fire-hooks, buckets (or even water in most parts of our city), should the fiery element assail us in a dry and windy season, the denouement of the awful tragedy would be a general devastation of our now flourishing City. The most practical means ought immediately be taken for creating a supply of water, the number of engines increased and put in working condition; and every other apparatus procured which can be of service in restricting the ravages of this powerful destroyer.

Editorial Note.—Cincinnati has now one of the most efficient modern fire departments in the country.

The Sectional Schoolhouse in Use in Minneapolis

By George F. Womrath

Business Superintendent, Board of Education, Minneapolis, Minn.

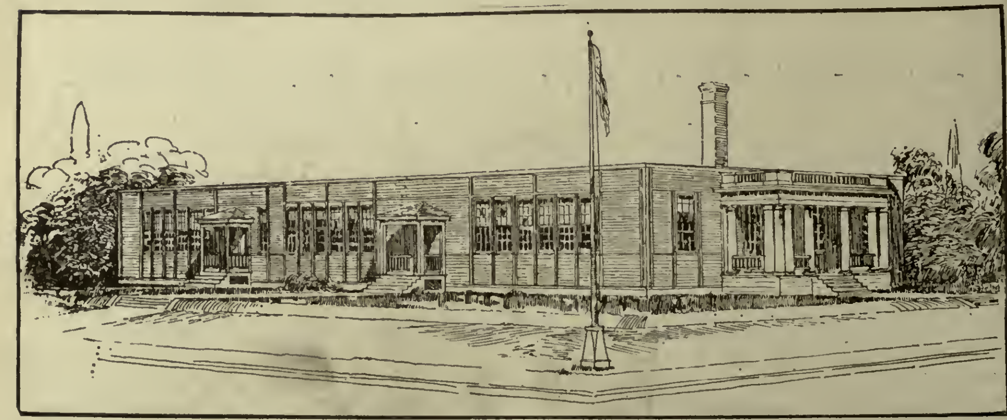
"PORTABLE" school buildings are usually looked upon as makeshifts —unattractive buildings with no conveniences for teachers or pupils, cold in winter and stifling in summer, and occupied only under protest.

The sectional schoolhouse which is used in Minneapolis has been built to eliminate every unsatisfactory feature of the ordinary portable. In fact, it is so complete and satisfactory as a schoolroom unit and lends itself so favorably to expansion and coördination, that it becomes merely a question of looks and size whether it shall ever be replaced with any other type of building.

This schoolhouse is built of separate sections of uniform size, which are interchangeable and interlocking, and can be easily and quickly put together or taken apart. This applies to walls, floors, partitions, ceilings—all parts of the structure. The economy and convenience of this construction is inestimable when it becomes necessary to enlarge a building or to move and transport it. Further, when the building is moved and reassembled, it may be made larger or smaller by either adding or taking away some of the sections. The flexibility of the sectional construction permits the windows and doors to be placed on any side of the building, and therefore does not interfere with the locating of a building for proper lighting and orientation on any site to which it may be moved.

The size of a standard school classroom in Minneapolis is 23 feet by 32 feet, with a 12-foot ceiling. The window space is at least 20 per cent of the floor area. The schoolhouse has standard entrance doors. The windows are double-hung, with regulation sash balances. The walls and floors are warm and of double construction, and well insulated to withstand the most severe climatic conditions of the coldest winters in Minnesota (50 degrees below zero). The roof is constructed to resist the strain of frigid winter conditions with heavy snowfalls; also to resist torrid summer heat. Ample air space is provided with a storm vestibule. From this there is a door which leads directly into the classroom and a door leading to a janitor's room. In the vestibule are the drinking fountains.

The classroom is equipped with 40 standard desks for pupils, a teacher's desk, a reference table, two chairs, window-shades, a waste-basket, etc. The blackboards are sectional and can easily be removed from the



THIS SECTIONAL SCHOOLHOUSE WILL WITHSTAND THE COLDEST WEATHER. ECONOMIC AND DURABLE, IT ACCOMMODATES THE STUDENTS IN COMFORT UNTIL A MORE PERMANENT STRUCTURE CAN BE PROVIDED walls. The lighting fixtures and radiation are arranged as they would be in any regular classroom.

At one end of the classroom is a wardrobe with two doors and an outside window. At one end of the wardrobe are book shelves and a teacher's private wardrobe with standard fixtures.

Each classroom is provided with a unit ventilating outfit, consisting of electric-driven fan, heating coils, air washer, etc. The temperature and humidity of the air are controlled by the thermostat and humidistat in the classroom. The fresh air driven into the classroom is discharged through the wardrobes, the doors of which are cut off 14 inches from the floor, and a vent at the ceiling of each wardrobe provides for complete air circulation and ventilation.

At the end of each classroom and opposite the wardrobe are two individual toilet rooms, one for girls and one for boys, each adjoining a lavatory equipped with wash bowl, mirror and towel rack. The toilet room and lavatory fixtures are the standard equipment with water and sewer connections. Between the two lavatories are two storage rooms fitted with book-shelves and cupboards.

A hot water or steam heating plant is provided and ample space for a winter's supply of fuel. The heating plant and fuel room may be located in a basement or in an extension to the main building.

A school site may be furnished with a single classroom with its vestibule, wardrobe, toilet rooms, wash rooms, book room and janitor's room and with its heating, lighting and ventilating equipment and water-supply system. To this schoolroom unit other units may be added from time to time, so located as to put all the buildings under one roof and to maintain a coördinate arrangement with corridors, central heating plant, administration suite, etc. This procedure can be expanded as desired and it is doubtful if such a group of buildings would ever have to be replaced with a building of more permanent type of construction (brick, stone, etc.) until it had expanded beyond 12 or 16 rooms. The construction is sufficiently substantial to serve for upward of 25 years.

The exterior of the building may be made unusually attractive with a colonial entrance porch and trellises with vines to cover the sides of the building, or stucco finish.

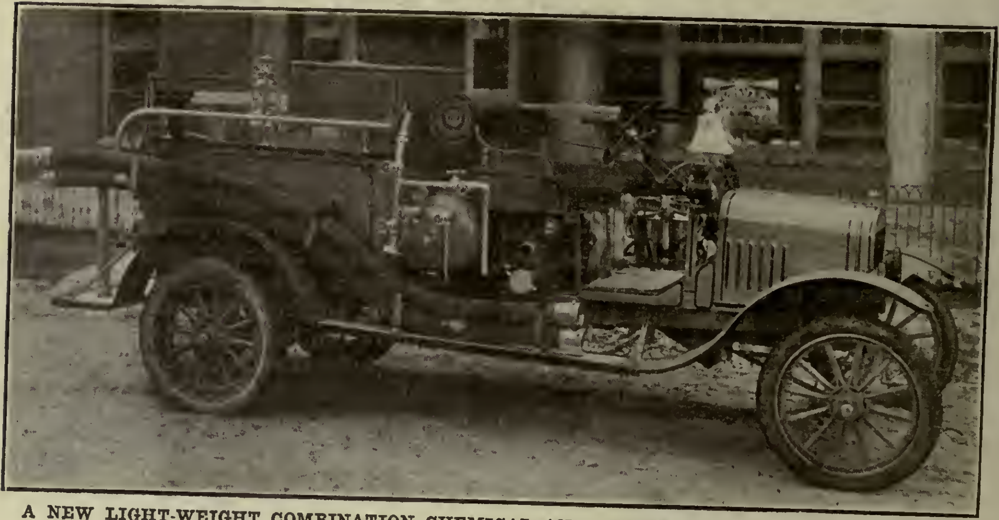
The Value of Pasteurized Milk

IN September, 1920, Nathan Straus, well known for his many philanthropic activities in New York City and particularly for the establishing of pasteurized milk stations throughout the city, from which fresh milk was sold at a very low figure to the needy, gave to the city of New York deed and title to this invaluable plant. In accepting the gift for the city of New York, Dr. Royal S. Copeland, Commissioner of Health, spoke most forcibly of the value of pasteurized milk in child welfare work, and it is from his remarks that the following material is prepared.

The pasteurization of milk has made it possible to bring it into the city sweet and palatable. But more important is the preservation of the milk from germs which will cause disease. Practically all of the cases of dysentery among children are due, or at least were due in the past, to the dysentery germ found in milk. Mr. Straus pointed out thirty years ago that it is possible to destroy not only the souring germs in milk, but also by pasteurization to destroy the germs of dysentery, tuberculosis, typhoid, scarlet fever and diphtheria. As an indication of what this has meant to the city of New York, consider the death rate of children five years of age. In 1891, the year before Mr. Straus began his work, the death rate of children under five years of age in New York City was 97 per 1,000, and in 1919 it was only 25 per 1,000. In 1891, the death rate of children under one year of age was 241 per 1,000, while last year it was only 81.

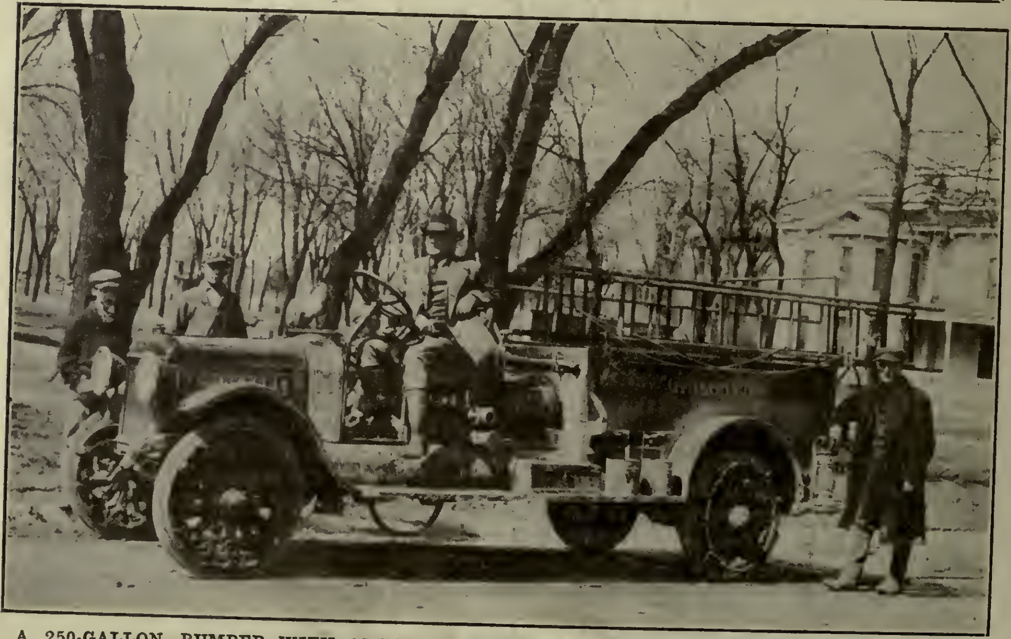
It has been the belief of Nathan Straus that when a private individual had adequately demonstrated the dependability of pasteurization, it was only right that the city itself should accept that method as a means of reducing the death rate and making the city a safer place for the infant. Because of this, the city accepted the generous gift of the laboratory and milk stations, in full appreciation of the duty and opportunity placed in its hands.

For Fire Fighting, Street Cleaning and Road Building—the Motor Truck

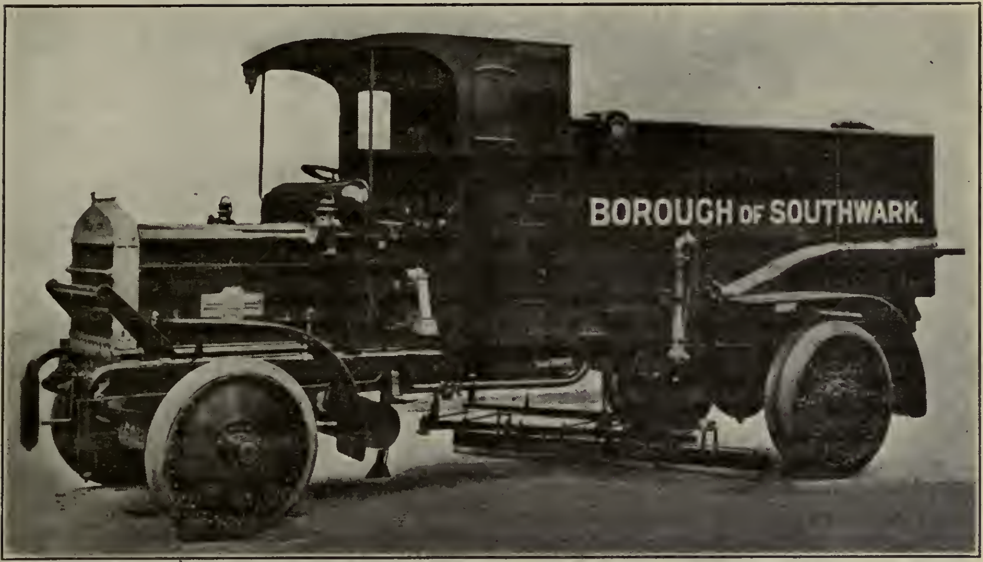


A NEW LIGHT-WEIGHT COMBINATION CHEMICAL AND PUMPER FOR SUBURBAN OR TOWN FIRE DEPARTMENTS MADE BY O. J. CHILDS

Well-manned motorized fire departments give a city a better fire insurance rating, according to the Standard Schedule for Grading Cities and Towns in the United States. This schedule will be described and covered in detail in the January and February issues of The American City.

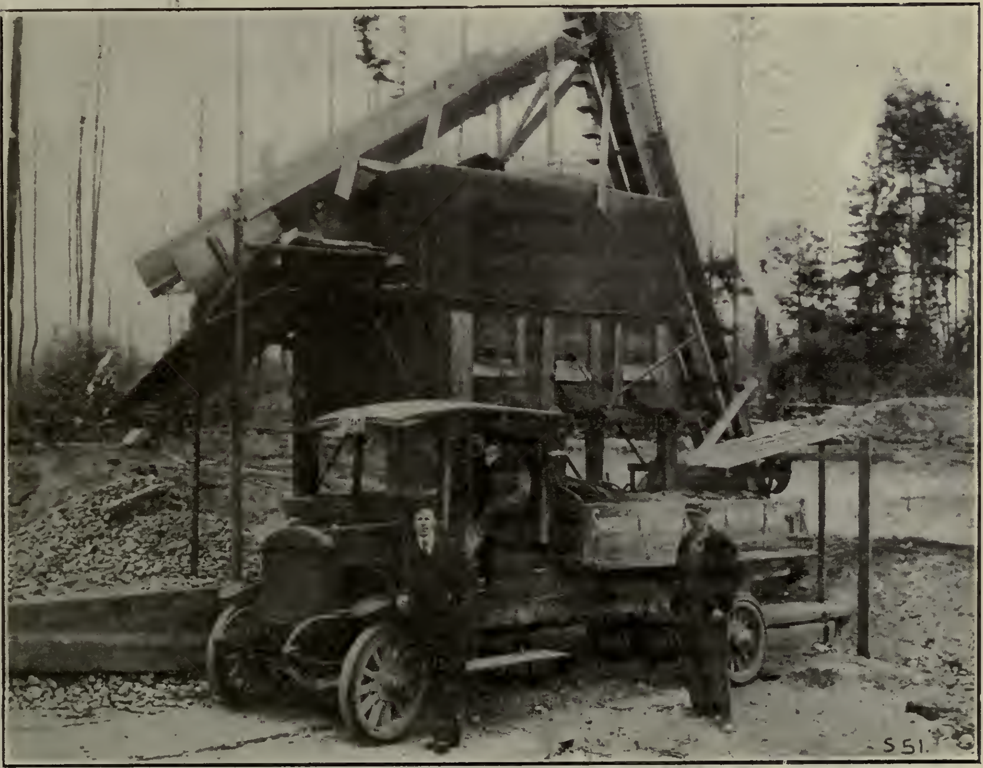


A 250-GALLON PUMPER WITH 35-GALLON CHEMICAL TANK OF OBERCHAIN-BAYER MAKE ON A REPUBLIC CHASSIS IN USE BY GIBSON CITY, ILL.



AN 800-IMPERIAL-GALLON ROAD WASHER, SOUTHWARK, ENGLAND

In this street washer the rectangular tank is mounted upon a standard chassis. Two distributing pipes run from this tank to the front of the motor, and a centrifugal pump, worked from the engine, forces the water through the pipes at a high pressure, thus effectively washing the surface of the paving. Underneath the tank is attached a set of three 30-inch lengths of rubber on the squeegee principle, which further assists the work.



A DIAMOND T TRUCK LOADING UP AT THE SEMI-PORTABLE PLANT OWNED AND OPERATED BY SNOHOMISH COUNTY ROAD DISTRICT NO. 1, EVERETT, WASH.

Turning Garbage Into Pork

Incineration Supplanted by Scientific Hog Feeding

By E. D. Keilmann

ABOUT ten years ago, in a wave of civic improvement, Topeka, Kans., erected a municipal incinerator at a cost of $18,000. When the plant was completed and in operation, the event was celebrated with a banquet given on the floor above the burning offal. Within three years after the date of that banquet, the plant, with its towering smokestack, was standing idle, a monument to over-hasty judgment. To-day the city is turning its incinerator plant into a warehouse for its street cleaning department. Its odorous problem is finally solved, but instead of turning its offal into cinders, Topeka is now reclaiming its waste matter and turning it to a profit, with the aid of a drove of 2,500 hogs, located just outside the city limits.

The Downfall of the Incinerator

When the incinerator was in operation the city collected garbage from the homes of the citizens for a fee of 40 cents per month. This waste matter and any other hauled to the city incinerator was burned at the city's expense. The plan had hardly been in operation six months before it was apparent that it was a failure. The independent collectors, though under heavier restrictions and regulations of new sanitary ordinances, continued to operate. However, they now picked their routes and collected garbage only in the more thickly settled parts of the town, where richer garbage could be had for the hogs they were feeding. Of course the citizens in these parts of the city saw no reason why they should pay a fee of 40 cents per month to the city for service they could get for nothing from independent collectors, and city collectors found long hauls and arguments over collection fees for their portion. At no time did the city furnish service on the fee basis to more than 5 per cent of the homes. More than that, as the city had no means under the law for enforcing collections other than cutting off the service, a large part of the fees were never collected. The laws also forbade the city from making obligatory the payment of any fee for service rendered by the municipality. While the cost of making collections of garbage and operating the incinerator ran up to and over $1,000 per month, the income was never over $250. At the end of three years the plan in its entirety was abandoned as a hopeless and expensive failure.

The First Contract to Feed Garbage to Hogs

It was not until in November, 1917, that the present plan began to develop. At that time a young stockman from Denver presented himself to Commissioner W. L. Porter and asked the city to grant him a

THE $18,000 DEFUNCT INCINERATOR IN TOPEKA monopoly of the rights to collect garbage from all hotels, restaurants and residences of the city. He planned, he said, to use the garbage to feed a large drove of hogs for the market. After many conferences, the company formed by the young man bound itself to abide by all sanitary restrictions and to furnish service to every part of the city free of charge under the direction of the city commissioner in charge of the sanitary department.

The new organization proved a success from the standpoint of the city. Garbage was collected regularly and in a cleanly manner from every can in the limits of the municipality, and the citizens at large were more than pleased at the new and simple plan which no one had ever thought of before. The company, however, failed to make money. Its hogs died at an alarming rate. More than that, the animals did not put on fat rapidly enough, and the turnover in pork was not fast enough to bring dividends to the investors. The company failed, and for a time it looked as though the city would once more be at the mercy of the "slop man."

New Organization Takes Over Contract

Arguing that inefficient management was the chief cause of the failure of the pioneers in the new venture, local men decided to take up the business where the old company had left off. They in turn were granted a contract similar to the first. The new organization worked along the same plans as the first, but, instead of shipping hogs to the Kansas City market, butchered and sold their pork at home. Because they did not observe all the necessary precautions for sanitation in this part of the work, the home butchers were soon in trouble with federal inspectors, and it became apparent that the local company was no better off than the first.

The Present System

On October 21, 1919, the Ziegler Livestock Company took over the property and contract of the local men and began operations on a new basis. They put at the head of their management a graduate of the State Agricultural College and gave him as an assistant another young college man who during the war had been employed by the Federal Government in the garbage disposal work connected with the great army cantonments. The company has been in operation a year and there is every evidence that the third trial is a success, both for the city and for the men who are collecting and using the garbage. The Ziegler Company declared its first dividend of 3 per cent March 1, 1920, and its second on August 1, 1920, was for 6 per cent.

For such a scheme to be successful, there must be strictly sanitary methods throughout. The new owners of the city contract have installed concrete feeding floors and concrete storage tanks, and insist upon absolute cleanliness on the part of every one of their employes. They select only healthy hogs for their herd, and before starting on the program of intensive feeding, they inoculate and vaccinate each animal against hog cholera and other infectious diseases. This precaution costs about one dollar per animal, which was considered prohibitive by the two companies which first attempted to make the scheme a paying proposition. These companies failed to keep the garbage clean for the hogs. It was dumped upon the ground for them to feed over and trample into mud. The result was that the hog farm soon became a locality to be avoided by persons traveling through the country. The filth bred disease, and it was a wonder that more hogs did not die.

Now three car-loads of hogs are shipped to the Kansas City Market each week, and at the same time three car-loads of "feeders" are added to the herd. It takes 180 days to bring a hog from the "feeder" class to the "fat hog" class, according to the officials of the Ziegler Company. Except for accidents, the death rate among the animals is not over one to the thousand. Most of the deaths, according to David Grey, manager of the farm, are caused by slight carelessness in handling the animals at the time they are inoculated.

Garbage at this farm is not the entire diet of the hogs. They receive mineral "conditioner" compounds, buttermilk from the creameries in the county, and toward the latter part of their stay are given certain "finishing off" quantities of corn. According to Mr. Grey, the garbage takes the place of shorts and tankage in the menu of the hogs and they like it better. The garbage costs, for its collection, $3.50 per ton. The shorts and tankage, which would otherwise be fed, cost, according to present markets,

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> February 21, 1920.
>
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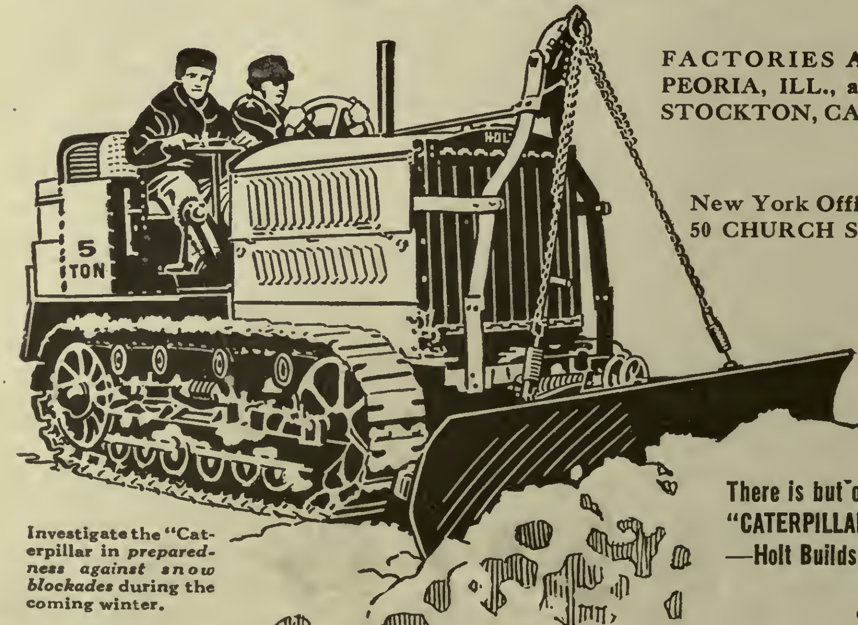


Investigate the "Caterpillar in *preparedness against snow blockades* during the coming winter.

There is but one "CATERPILLAR" —Holt Builds It.

C-3

ONE OF THE TANK WAGONS USED FOR GARBAGE COLLECTION IN TOPEKA

These wagons each haul an average of 2½ tons of garbage daily and are disinfected between loads

in the neighborhood of $60 per ton.

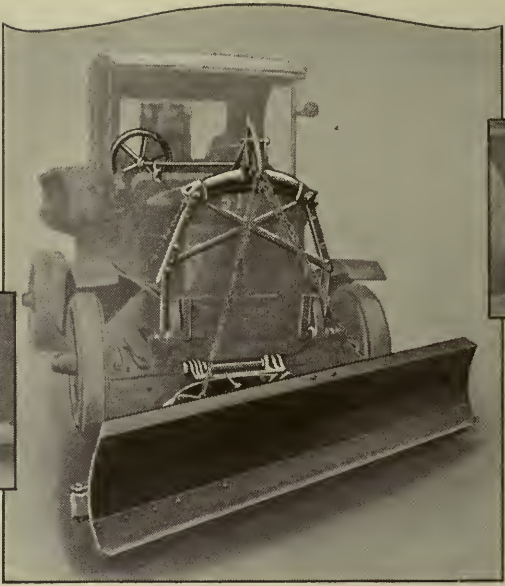
In the difference between $3.50 per ton for garbage and $60 per ton for tankage and shorts lies the margin of profit for the company. Right now the pork market is fluctuating with annoying irregularity. Many other feeders are either holding their animals off the market, hoping for better prices later, or are dumping them and taking big losses. The success of the Topeka plan, as far as the company is concerned, depends upon regular shipments of animals and a constant turnover. This would not be at all possible were the local company to be in the same position as the feeders who have to buy high-priced feeds all the time they hold their hogs and who must obtain a certain figure of loss on the animals they have fattened and then dumped. The varying prices in Kansas City of course do affect the profit side of the ledger, but they do not turn profit into loss. The margin of profit is too large.

When the first contract was let to the young man from Denver and certain local capitalists realized what a possibility there was in the business, a loud wail went up over giving away to outsiders a valuable franchise. It was with something of this idea that the second company of local men was formed. The failure of the two companies has shown everyone that it takes management and ideas to handle even garbage and clean up a profit. At the same time Topekans have found that the more money a company makes in its business, the better attention that company pays to its business. The more attention paid to the garbage collection business in Topeka, the better service the citizens have in keeping the smells out of their alleys.

Topeka alleys are now clean. The garbage cans are emptied twice each week into closed and odorless wagons. The garbage is hauled without smell to a smell-less farm, which is fast assuming a most businesslike aspect and is becoming an asset to the city in more ways than one. It is estimated that if the city government was to assume the job of free collection of the twenty-three tons of garbage placed in Topeka alleys daily, it would cost approximately $60,000 per year. This last sum represents the profit made by the city of Topeka out of the Topeka plan. Nine per cent dividends already declared represent the profit made by the men who are handling the garbage. Their capitalization is $100,000, of which only $68,000 has been sold.

The company is expanding its business, and in the course of another year an additional thousand hogs will be added to the herd. Right now the company is collecting much more garbage than it can feed. The extra hog food is not wasted. It is sold to smaller hog raisers in the country districts about Topeka and thereby disposed of to the advantage of all.

Champion Snow plow, showing rear view of scraper bar.



Close up, showing improved axle clamps, semicircle tilting mechanism, etc.

The Champion Snow Plow

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These plows are attached to any standard motor truck and can be detached at will. The truck is available for any other purpose when the plow is not in use.

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Municipal Finance

BONDING ACCOUNTING TAXATION

Dollars Speak in City and County Consolidations

By Leo H. Joachim

WHILE county government is a big thing in the United States, costing in the year preceding the war $385,000,000, or one-third as much as the total expenses of the Federal Government, it has received comparatively little attention from the electorate and even from students of political science, so that it is only recently—in fact, during the last few decades—that sincere steps have been taken toward the correction of its flagrant abuses. "County government," in the words of a statement prepared by the Committee on County Government of the National Municipal League, "is the most backward of all our political units, the most neglected by the public, the most boss-ridden, the least efficiently organized, the most corrupt and incompetent, and by reason of constitutional complication, the most difficult to reform." Indeed, the activities of the county have been traditionally so shrouded in mystery that few citizens have had the desire, much less taken the trouble, to penetrate the sacred confines of this governmental unit; and of late years we have had the spectacle of city government growing generally better and more efficient to the accompaniment of county government growing progressively worse and ill-managed. City officials are coming more and more under the close scrutiny of the voting public, while county officials are still serenely nestled and undisturbed in the shelters of obscurity.

The growing movement in this country for the consolidation of city and county government is one of the results of the ever-spreading realization of the flagrant inefficiencies of present county organization, its needless duplication of many city functions, and—most of all—the staggering financial losses directly traceable to this duplication and to the general incompetence in management. This latter circumstance, perhaps more notably than any other, constitutes an almost incontrovertible argument for city and county consolidation in large centers of population, where the city is coterminous with the county unit, where urban interests dominate over all others, or, finally, where there is an aggregation of several towns with interests rather industrial than agricultural.

The question of consolidation is not a local consideration restricted to a particular area in the United States. Consolidation is already an accomplished fact in one form or another in St. Louis, San Francisco, Baltimore, Denver, and Los Angeles. Consolidation has been and is being discussed, in addition, in many other important cities in the country, including Chicago, Rochester, Buffalo, New York, Toledo, Wilmington, Del., Indianapolis, Kansas City, Cincinnati, Pittsburgh, Jersey City, Butte, Oakland, Calif., and other cities. Detroit is contemplating a consolidation allowing city officers to assume activities similar to those of the county officials. Prominent interests have been in favor of amalgamation of city and county governments in Milwaukee, and in Philadelphia the movement was favored by the Bureau of Municipal Research and the charter revision committee of 1917. Altogether, about twenty cities have made efforts to eliminate their county government by consolidating it with the city. In California the constitution has been so amended that barriers to consolidation have been quite effectively removed.

Expensive Duplication of Effort

The movement for city and county consolidation, there is no doubt, had its direct

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origin in the great losses taxpayers have suffered all over the country as a result of the increased and ever-soaring costs of county and city government. In fact, it is the financial savings of consolidation that are among the most imposing in the array of arguments presented for city and county consolidation. The needless, almost wanton, duplication of officials and functions that characterizes city and county government to-day, cannot but redound to the enhancement of tax bill dimensions. It was only recently that the City Club of Milwaukee ascertained that, while the city maintained an emergency hospital, a tuberculosis sanitarium, and a corps of milk inspectors, the county was doing almost the same things. The city handled highways through a highway department, and the county through an engineering department, but the administration was practically duplicated. City and county did their purchasing separately. Separate city and county governing bodies added materially to the expense of government.

In Los Angeles County it was recently ascertained that the people were paying for three different kinds of police protection: the sheriff and his deputies; the constables of the several townships; and the police of the city. Each year as the cities expand in area and jurisdiction, the police force is correspondingly increased, but no reduction is ever made relieving the sheriff and constables of duties.

There is enormous duplication in the purchase of supplies by city and county. Counties often maintain a poor farm, and cities usually maintain an institution erected for similar purposes. By a combination of the two many thousands could be saved. Both county and city purchase thousands of dollars worth of stationery and printing, the expense of which would be lightened by making one contract of it. The city may have idle road-building machinery, while the county is purchasing identical machines. Frequently there are separate rock-crushing plants for the two governments, sometimes separate gravel beds. One may have a shortage of labor, while the other is laying off men. Often there are two forces of men assessing property at the county-seat, one at the court house and the other at the city hall in the very same city.

The coördination of the road policy of the county and the street construction of the large city has never been worked out efficiently in the typical American county. Often the county commissioners or supervisors may decide upon some important road improvement, and the road when constructed may lead to the limits of the city, but its effectiveness may be lost absolutely as a result of the failure of the city to construct a street system that will properly coordinate with it.

Plans for community development are rarely coördinated among different communities in a county, and the inability of the larger city to direct intelligently its growth often means the loss of millions in dollars. Cleveland, for example, while permitted by state law to plat subdivision for a distance of three miles outside the city limits, has had to face the prospect of the wasting of its efforts in this direction because of legislation permitting the small suburban cities just outside the limits of Cleveland to do the same. As a result, new plans are being constantly devised with no new view toward the ultimate development of the sewage system, the park and boulevards, and the extension of the greater metropolis.

The assessment processes under elective county officials rather than those technically qualified is rarely scientifically carried out. When the county has a need for money, all it has to do is to create an additional tax through its supervisors, property is liable for it, and there is no redress. In Texas, to take a chance example, though the law provides that property should be assessed at 100 per cent of its value, the assessing of property in a large number of counties in Texas drops down to between 25 and 10 per cent of its actual value. As a result of inefficiency and mismanagement due to dual and duplicated departments, many owners having paid their taxes faithfully for many years suddenly find themselves confronted with records of the department stating that taxes have not been paid. Many hundreds of land titles are clouded, and long after money has been paid, individuals are forced to pay double the tax and the costs in order to get the property cleared.

It must be perfectly clear that if a city pays, as is the case with Cleveland, 85 per cent of the taxes of the county, 95 per cent as is the case in Toledo, and the county still retains an administrative staff duplicating that of the city, there is obviously waste of effort and expense, avoidable only through

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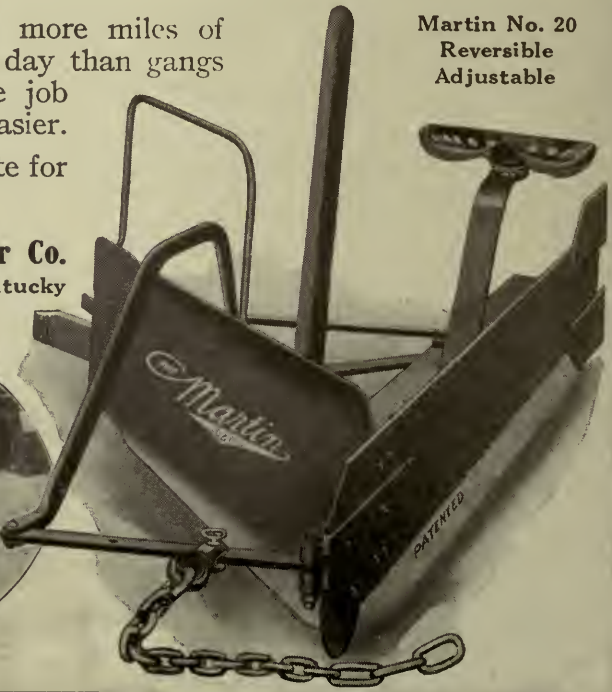

consolidation. If a city's population constitutes the great proportion of the county's population, it is unreasonable to expect it to pay for an administrative machine equal to and coördinate with that needed for itself. According to compilations made by the Research Division of the American City Bureau, the percentage of city population to that of the county, in regions where the movement for complete consolidation is strong, averages in the vicinity of 84, and in many cases far exceeds that.

Consolidation Brings Economy

In view of these circumstances it is not surprising that great savings have been claimed for cities and counties that have consolidated their governments partially or entirely, and that similar ones are being predicted for the communities engaged in contemporary campaigns for consolidation.

To take a glance back at history, San Francisco, for example, effected significant financial savings at the time of its consolidation with the county government in 1856. In that year it secured from the Legislature a new charter in which the city council was supplanted by the county board of supervisors, and the city assessors by the county assessors; and several officers who had hitherto only acted for the one government were given functions for both.

Under the consolidation great financial savings were at least originally made. It was calculated by the historian Hittel that the expenses of the city and county government were reduced from $2,640,000 in the year before consolidation to $350,000 in 1857. While original savings were probably not duplicated in after years, it is nevertheless true that the financial history of San Francisco is freer from scandal than it would otherwise have been. It is a familiar story how St. Louis also effected a not negligible saving during the year after its consolidation in 1875, when by means of a specific provision in the state constitution that city separated itself from the circumambient county, and such offices as sheriff, coroner, and public administrator were done away with. The original plans provided for the elimination of duplication in official functions and duties by abolishing certain offices and readjusting the duties of others.

The beneficent financial effects were immediately apparent despite the fact that the city assumed the entire county debt, interest and principal, in return for certain county property within the city. While the savings were not as notable in the ensuing years, it is undeniable that significant economies were effected that would have been impossible under the old system. The tax rate was reduced by 62 cents on $100 the year after consolidation, and the next year it was reduced still more by 15 cents. It was estimated that the net savings in expenditures under the new system totalled close to $1,000,000 per year.

No less interesting than these figures are those estimated by responsible organizations in the various cities contemplating consolidation. It was estimated some time ago that New York City could save at least a million per year if it would consolidate its five county governments with its city government, Chicago three millions, and Cleveland three millions. Alameda under the limited form of consolidation that has been proposed for it would save one million, and in Wilmington, Del., it has been figured, economies to the amount of $8,000 would be effected in the process of tax collection alone. Los Anglees, under only limited consolidation, saved $100,000 in the year 1917-18, and would save under complete consolidation, it is estimated, as much as $2,000,000. *(To be continued)*

The Municipal Bond Market

During the month of November, municipal bond prices moved into higher ground, according to the *Daily Bond Buyer*. Unsettlement in business and a consequent decline in industrial securities tended to render such bonds more attractive, while a reduction in the volume of new issues gave added firmness to the market. The aggregate of municipal and state securities for the month was about $45,000,000, as contrasted with October's figure of $61,500,000. This brings the total for the first eleven months of the year to $666,535,000, as against $770,195,000 for the whole of 1919. As a considerable number of authorized issues are held up awaiting more favorable conditions, it is anticipated that a period of cheaper money would bring many municipalities into the market for the completing of much-needed public works.

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After thoro tests under the most exacting conditions in removing huge piles of snow and ice last winter- New York City has purchased a Friedman "Snow Loader".

Last winter the Friedman machine loaded trucks of 8 cubic yards capacity at an average speed of 60 to 90 seconds. Its use cuts the cost of snow removal about 90 per cent. Write for information.

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Asphalt Pavement Specifications

Fundamental Features of Specifications Recently Prepared by the Asphalt Association

THE committee which has recently prepared a complete set of specifications for various types of asphalt pavement has paid special attention to the form and arrangement of the specifications with an idea to making them definite, precise and free from ambiguity. During the preparation of the specifications, the committee had before it data from every state highway department in the United States as well as those of a large number of the principal counties and cities and of the United States Bureau of Public Roads. The committee, with Prévost Hubbard, formerly Chief of the Division of Tests and Research of the U. S. Bureau of Public Roads, as chairman, was composed of practical and experienced engineers.

A summary of the fundamental features of each set of specifications follows:

(1) *Asphalt Macadam Surface Course.*—A minimum thickness of 2½ inches utilizing a coarse aggregate of 1½- to 2½-inch crushed stone and asphalt cement of from 80 to 150 penetration is recommended. The limits of penetration of the asphalt cement are to be specified by the engineer within a 10-point range if below 90 and within a 30-point range if over 90 penetration.

(2) *Asphaltic Concrete Surface Course (Coarse Graded Aggregate Type).*—A finished thickness of 2 inches of asphaltic concrete composed of coarse aggregate 95 per cent of which will pass a 1¼-inch screen, fine aggregate, 4 to 6 per cent of filler, and 5 to 8 per cent of asphalt of from 50 to 70 penetration (10-point range fixed by engineer) are the outstanding features.

(3) *Asphaltic Concrete Surface Course (Fine Graded Aggregate).*—A finished thickness of 2 inches, with coarse aggregate 95 per cent of which passes a ½-inch screen, sand, 7 to 11 per cent of filler, and 7.5 to 9.5 per cent of asphalt with a penetration of 50 to 70 (10-point range fixed by engineer) are recommended.

(4) *Sheet Asphalt Binder and Surface Course.*—Binder and surface courses each having a thickness of 1½ inches, binder course to have 60 to 80 per cent coarse aggregate, sand, and 4 to 6 per cent of bitumen, the asphalt cement for both courses to have a penetration of from 30 to 60 with a 10-point range fixed by engineer. The surface course mixture is as follows:

	Retained On	Per Cent
Passing 10 mesh..........	40 mesh	10 to 40
Passing 40 mesh..........	80 mesh	22 to 45
Passing 80 mesh..........	200 mesh	12 to 30
Passing 200 mesh..................		10 to 20
Bitumen		9.5 to 12

(5) *Asphalt Base (Asphalt Macadam Type).*—To consist of two courses, the first to have a thickness of 3½ inches, and the second 2½ inches, coarse aggregate for the first course to consist of 2½- to 3½-inch stone and for the second course 1¼- to 2½-inch stone, asphalt cement to have penetration of from 80 to 150 (fixed within a 10-point range if less than 90 and a 30-point range if over 90, by engineer); one application of asphalt at the rate of 1.25 to 1.5 gallons per square yard to be made upon each course, and the second course covered with a thin layer of ¾- to 1¼-inch stone.

(6) *Asphaltic Concrete Binder and Surface Courses.*—This specification provides for a 1½-inch course of fine grade aggregate asphaltic concrete wearing course as specified under (3) laid over a 1½-inch binder course as specified under (4).

(7) *Gravel Base.*—To consist of two courses, each not less than 4 inches in thickness after compaction, 95 per cent of the gravel to pass a 3½-inch screen, and 50 to 75 per cent to be retained upon a ¼-inch screen.

(8) *Macadam Base.*—To consist of two filled courses, each not less than 3 inches in thickness, 95 to 100 per cent of the crushed stone to pass a 3½-inch, and 0 to 15 per cent a 2½-inch screen, 95 to 100 per cent of the screenings to pass a ¾- or ½-inch screen, and 40 to 80 per cent a ¼-inch screen.

(9) *Reconstruction of Old Macadam to Serve as Base Course.*—Provides for reconstruction of old macadam in order to secure a minimum thickness of 6 inches after compaction.

(10) *Telford Base.*—Provides for hand-laid 8-inch telford base.

(11) *Portland Cement Concrete Base.*—A mixture in the proportions of 1:3:6 with a thickness of 6 inches as specified.

(12) *Truing up Old Pavements to Serve as Base Course.*—Provides for truing up old pavements by the use of an asphaltic concrete mixture in preparation for the application of an asphaltic wearing course.

(13) *Preparation of Subgrade.*—No explanation required.

(14) *Subbase.*—Provides for a subbase of field stone filled with smaller fragments and compacted.

(15) *Shoulders, Headers, Curbs and Gutters.*—Provides for gravel, water-bound and asphalt macadam shoulders, and portland cement concrete headers, curbs, and gutters.

Twenty lives — and the public blames us!

"I DON'T see why they should blame us," said Mrs. Allinson to the Secretary at the Trustees' Meeting. "We did everything for them up there. They were just like a big, happy family until this—this happened," and her voice broke a little.

It was a home for Aged Men. Everyone in the city was proud of the Home. To serve on its Board of Trustees was an honor.

The building was well heated, well lighted, well furnished. The stairways were broad and easy to go up and down. There was a fire alarm and a coil of fire hose in every corridor.

But a stealthy, creeping flame started in the basement at midnight. At two o'clock most of the first floor was a mass of flames. Then the alarm rang. Doctors, nurses, attendants, everyone worked with superhuman strength. They guided the weak and carried the helpless down the one passable stairway.

In spite of every effort, twenty feeble old men were lost.

Next day the town rang with bitter denunciation of the Board of Managers.

It seemed so evident now to every intelligent man and woman in the community that just a half-hours' thought and planning for the installation of a Grinnell Sprinkler System would have prevented the tragedy. Twenty lives! What a cruel toll to pay for lack of foresight.

Fire has caused a loss of over forty million dollars in schools, colleges and institutions in the last eight years. Add to these startling figures the fact that hundreds of lives have been lost through these same fires.

Then ask yourself: Are you doing all you can to safeguard public property and life in your town?

Read—"*Fire Tragedies and Their Remedy*"

If you are on a school board, a board of managers or in any position where a trusting public has placed human lives in your hands, it is clearly your duty to see that these lives are safeguarded. Send for "Fire Tragedies and Their Remedy." It costs just the price of a post card. Write us today, now, before you put aside this magazine. Address: Grinnell Company, Inc., 283 West Exchange Street, Providence, R. I.

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News and Ideas for Commercial and Civic Organizations

Keene Chamber Provides Houses

KEENE, N. H.—The Keene Chamber of Commerce recently took steps to relieve the local housing situation. A Housing Committee was appointed to make a study of the methods employed in other cities and of the needs of Keene. The committee's report resulted in the organization of the Keene Home Builders, Inc., with a capital of $50,000. The stock was purchased by the merchants and the manufacturers in about equal amounts.

Contracts for the construction of about twenty houses were let on April 20, and the majority of these are completed. The housing corporation is not only building the houses, but is handling the second mortgages, the banks and the building and loan associations taking the first mortgages. The houses are intended to be occupied by working men, and are being sold to them on 10 per cent cash payments, the balance payable in monthly installments as rent.

The discussion of the subject and the publicity work which the Chamber of Commerce has done in connection with this activity is partially responsible for the erection of twenty other houses by manufacturers and private builders. The city's immediate needs have thus been taken care of.

PRICE GAINES,
Secretary, Keene Chamber of Commerce.

Knoxville's Exhibit of Natural Resources

KNOXVILLE, TENN.—The Knoxville Board of Commerce had an interesting exhibit at the National Exposition of Chemical Industries recently held at the Grand Central Palace in New York. It was located on the mezzanine floor and occupied about the space usually devoted to six booths. An attempt was made to present the resources of the region of Knoxville in a way to inspire confidence in the future possibilities of this part of the country, and, from the reports that have been received of the impressions made by the exhibit, the attempt was successful.

The exhibit consisted of tables containing the various mineral and chemical products of the country surrounding Knoxville, and had as a background three large maps illustrating the topography and resources, both natural and man-made, in a graphic way. An invitation to investigate the possibilities of the region was conspicuously placed, and the manner in which crowds collected around the exhibit gave evidence of the effectiveness of the advertising.

WILLIAM R. POUDER,
Manager, Knoxville Board of Commerce.

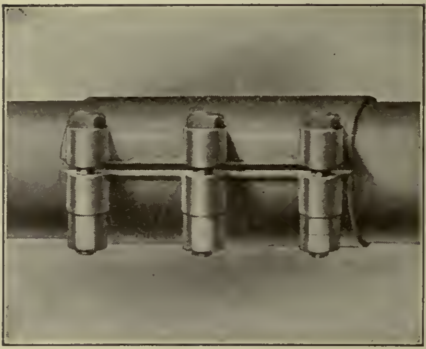
Bridgeport's Hallowe'en Spectacle

BRIDGEPORT, CONN.—Bridgeport held its first community Hallowe'en celebration this year. The spectators and participants all expressed great satisfaction with the event, which was named "The Municipal Frivols of 1920." From all indications, it will become an annual affair.

The celebration resolved itself into a parade and community dance on the streets. The parade included scores of floats, twenty-five of which represented different childhood stories. A gypsy-costumed storyteller accompanied each float, and, after the parade, told the story to the people who grouped themselves around the float.

This was the joint creation of the Bridgeport Chamber of Commerce and the Recreation Board. There were at least 5,000 people in the parade, and the down-town crowd was estimated at from 50,000 to 75,000. The prevailing thought in the minds of the committee on arrangements was ingenuity, not expense, and the clever character portrayals were real master-strokes.

The merchants coöperated by decorating their windows appropriately, and they and the manufacturers, several of the fraternal, civic and social organizations, business and professional clubs, public school groups, and various other organizations, joined in both



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Considered in this light, it must be seen that MEDART apparatus cannot be sold on a price basis. But it is sold on an economy basis—thorough construction for the sake of safety and long life of the apparatus go hand in hand. In buying playground apparatus, divide the cost by the years of service it will give, and MEDART apparatus will be your choice.

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Catalog "L" is undoubtedly one of the most complete treatises available on playgrounds and playground planning. It is reaily a textbook. When you send for it please outline in brief just what your problem is—you will have our earnest and intelligent co-operation.

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float and marching representation. The parade included five full bands and numerous musical clubs. Forty-five prizes were awarded to various groups and individuals for distinctiveness in costuming. The retail merchants provided the prizes.

So little disorder was noticeable that the Police Department gave out the following brief statement regarding that aspect of the affair:

> "Not a report of theft from the person, insult or assault had been received by the police up to midnight, one hour after the crowds had dispersed. The ambulance was not called to any point in the city, and, according to attendants at the emergency hospital, not one patient was treated as a result of the intermingling of masked persons in the streets."

It is the belief of the Bridgeport Chamber of Commerce, however, that such negative results, fine though they be, are far outweighed by the excellent community consciousness such an event engenders. And it is much easier after a joyous celebration of this kind to get the citizens to work together for community betterment objects of a more concrete character.

SEWARD B. PRICE,
Executive Secretary, Bridgeport Chamber of Commerce.

Another Traction Problem Solved

Sioux City, Iowa.—The continued increase in the cost of living made it necessary for the employes of the Sioux City Service Company to ask for an increase in wages early last summer. While the traction companies in a number of the larger cities had raised the fares to six and seven cents, the fare in Sioux City remained five cents, and no attempt had been made to increase it.

The Service Company now faced the actual necessity of raising the wages, and came to the Chamber of Commerce for help in solving the problem, because, while it appreciated the fact that its employes were entitled to the increase, it did not see how this could be granted except at a great loss.

The Chamber appointed a committee to take up the matter, and invited other civic organizations, as well as the trades and labor assembly, to appoint representatives to meet with this committee. The committee was instructed to investigate the subject thoroughly and to take whatever action seemed necessary to enable it to arrive at a solution of the difficulty. Expert accountants were employed to audit the books of the Service Company and ascertain its financial condition. An investigation of the living conditions of the street car men was also made by persons who understood the situation thoroughly.

After the investigation was completed, the committee was satisfied that the conditions warranted a raise in wages and an increase of the fare to six cents. A petition was therefore presented to the City Council setting forth the reasons for those conclusions and asking that a special election be called to allow the voters to decide whether or not the fare should be raised. The Council acted favorably on the petition and called a special election for August 17.

The committee returned its report to the Board of Directors of the Chamber of Commerce, which adopted the following resolution:

Whereas, the joint committee representing the Chamber of Commerce and other organizations has made a thorough investigation into the pay of the street car employes and had expert accountants examine the books of the Service Company to determine its financial condition, and

Whereas, the said committee has found that the employes are deserving of an increase in pay and that the street car company on its present fares cannot afford to grant such an increase, and

Whereas, they have further found that an increase in fare to six cents would just about meet the increase in wage agreed upon and increased operation cost without yielding any excess profit to the company,

Therefore, be it resolved, that the Board of Directors of the Chamber of Commerce most strongly endorse the proposed increase and recommend it to the favorable consideration of the public in the coming election to be held on this proposition August 17.

This resolution was given wide publicity, and what at first looked like strong opposition faded away, with the result that the increase carried by a large majority. The Service Company promised not only an increase of wages to the men, but also more cars and better service.

This is another instance where a well-organized chamber of commerce has avoided a critical situation, and probably a strike, by taking the affair in hand and providing the means for unbiased investigation which

The City of Duluth, Minn., in the background.

The Monroe Is Paying Big Dividends To Duluth

IN the office of Duluth's City Engineer everything is run on a high plane of efficiency. And the city engineer doesn't hesitate to give due credit to the Monroe Calculating Machine for the part it has played.

"The Monroe has paid for itself several times over," he writes, "and it would be difficult for us to get along without it."

On the Monroe you can add, multiply, divide and subtract, with a constant proof of accuracy always before you.

And so simple to operate. Merely set the numbers on the Monroe keyboard and turn the crank—forward for addition and multiplication, backward for subtraction and division.

Any clerk in your office with a half hour's instruction on the Monroe can equal the volume of work turned out by a specially trained operator on other machines.

The Monroe is carrying the burden of all the figure-work in a great many City, County and State offices—in the Engineer's Office, Water Department, Treasurer's Office, Tax Department, Assessor's Office, Board of Education, Hospital Commission, Department of Health, Comptroller's Office, etc.

Send coupon for "How New York State saved $85,000" or a demonstration.

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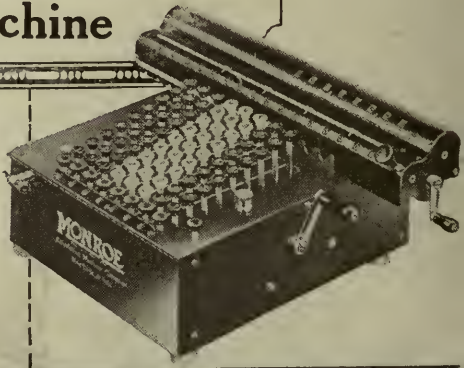

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] Arrange for a demonstration in our office on our own work.
] Send us folder, "How the State of New York Saved $85,000."

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resulted in justice being done. It also demonstrated to the employes generally throughout the city that the Chamber of Commerce was ready to deal fairly with them, and brought about a closer working relationship between the business and the laboring interests.

WILLIAM HOLDEN,
General Secretary, Sioux City Chamber of Commerce.

Macon Woman's Auxiliary in Action

MACON, GA.—The Macon Chamber of Commerce has an active Woman's Auxiliary, with an enrollment of 200 members, which is working hand in hand with the parent organization in its efforts to promote the welfare of the community. While the plan of organization parallels that of the Chamber of Commerce, and provides for a departmental committee to coöperate with each corresponding committee of the Chamber, there is a distinctly separate program of work for the Auxiliary. The latter is designed to supplement the activities of the central organization and to give special attention to those lines of work in which women are most interested and most capable of rendering effective service. The receipts from dues in the Auxiliary and from other sources are used to pay the salary of the secretary and defray other expenses.

The members are for the most part the wives, mothers, sisters and daughters of the members in good standing of the Chamber of Commerce. The membership is divided into seven groups, to each of which is assigned a certain department of work, to be carried on under the direction of the committee in charge. All questions of general policy require the approval of the directors of both the Chamber of Commerce and the Woman's Auxiliary.

The Auxiliary was organized only last February. One of the first items in its program of work was to transform the trunk highways which transverse Bibb County at right angles with each other into Roads of Remembrance as a soldier memorial. The two highways themselves form a cross, and the four sections of the highway are to be lined with trees planted in cross-formation as a memorial to the Bibb County men and women who served in the World War. Native flowers and shrubs are to be planted between the trees, and the banks along the side will be covered with Cherokee roses. Bronze markers, containing the names and former addresses of the soldiers, and gold stars if they died in the service, will be placed on the trees. The work was started this fall and will probably be completed within two years, making of this Road of Remembrance an everlasting memorial.

The Department of Transportation has been in charge of this activity. That department is also conducting an investigation into the conditions of transportation as they affect the comfort and welfare of women. It is also promoting the work of the Traveler's Aid Society, and working for the improvement of the facilities for women at the Terminal Station in Macon.

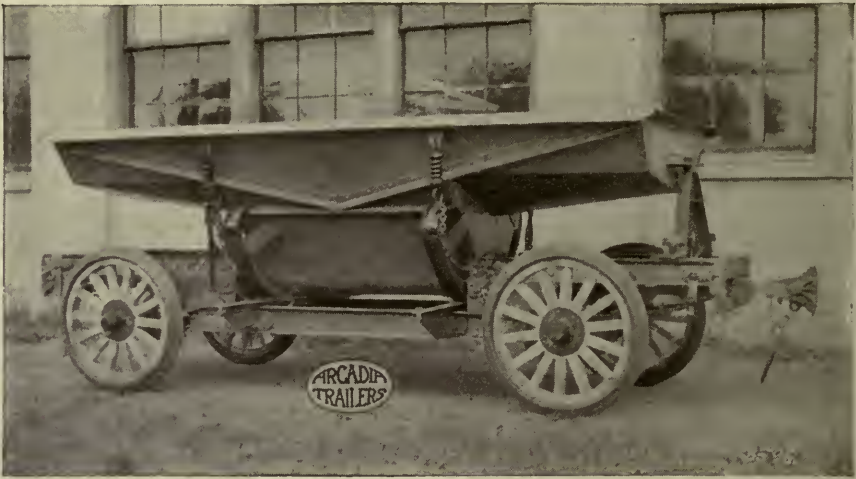
The Chairman of the Department of Agriculture recently petitioned the City Council for an ordinance to permit curb marketing. Such an ordinance was passed. It stipulates certain hours during which the farmers may bring their produce to the community market-place, where it is sold to the consumer direct, thus eliminating the expensive middleman. The department is endeavoring to popularize coöperative buying of farm products and wayside buying by motorists. It is also promoting the organization of Girls' Clubs, offering prizes for the best records made by the girls.

The Department of Civics takes charge of the annual observance of Civic Week, giving special attention to the clean-up and beautification campaigns. It is also coöperating with the City Council in the development of the municipal parks, and promoting the organization of the Junior Y. W. C. A., Girl Scouts, and Campfire Girls.

It is engaged just now in converting Macon into the "Rose City of the South" by the planting of roses on public and private grounds throughout the community.

The Department of Industry is conducting a survey of conditions affecting women employed in industrial plants. It is also promoting the beautification of factory and home grounds in the mill districts, and conducting a campaign among housewives to popularize the use of Macon products.

The Department of Publicity and Conventions provides special committees to welcome and entertain the women who come from out of town to attend conventions held in Macon. It is also promoting the develop-



TWO, THREE AND ONE-HALF AND FIVE YARD CAPACITIES.

KEEP YOUR CITY CLEAN

By Removing Garbage, Rubbish, Ashes, Etc., in

ARCADIA LOW SIDED DUMP TRAILERS

Strongest drop frame Trailer made (Patents pending). Made by one of the oldest Trailer manufacturers.

Reversible; will tow in trains. May be backed. Will not sway nor cut corners. May be drawn by horses when desired.

SYRACUSE, N. Y., USES ARCADIA TRAILERS

This body dumps either side. Locks to prevent accidental dumping.
Clears itself when dumping. Garbage tight, does not leak.
One man dumps it. No bar nor jack required.

Full Particulars on Request. We want to figure on your requirements.

ARCADIA TRAILER CORPORATION
27 MURRAY STREET NEWARK, NEW YORK STATE

ARCADIA TRAILERS FOLLOW THE TRACTOR—ANYWHERE, EVERYWHERE.

ment of the musical festival, and popularizing the use of the Macon automobile emblem. It also coöperates in conducting the annual style show, automobile exposition, and automobile tours.

The Department of Membership and Organization Affairs conducts a continuous campaign to increase the membership of the Auxiliary; the goal is 1,000 by the end of its fiscal year. This department takes charge of the annual outing of the Chamber's members and their families, and arranges for and conducts joint meetings of the two organizations.,

The departmental plan has proved a very successful method of getting things done here. We find that we can execute the work that falls to us more expeditiously by having departments organized and ready to respond at a moment's notice, should the need arise, than if we were obliged to appoint a special committee and take the time to organize and instruct each time. It was found that interest in the activity and results were greater when we could turn a problem over to a department chairman who knew just what the situation demanded, and who could call upon loyal members to do the necessary work.

(MRS.) NEAL WYATT CHAPLINE,
Secretary, Women's Auxiliary, Macon Chamber of Commerce.

Editorial Note.—Mrs. Chapline's remarks about the success of the departmental organization were occasioned by our specific inquiry as to the success of the plan, for it is generally recognized that while the departmental plan is theoretically attractive, it seldom works out as well in practice as the special committee plan, under which a special committee is appointed for each task and discharged when the task is completed.

Skating and Swimming Tournaments Popular in Fort Collins

Fort Collins, Colo.—For the last three years the Fort Collins Commercial Club has conducted a skating tournament in the winter and a swimming tournament in the summer at Sheldon Lake, in City Park, one of the city's four beautiful recreation spots. The lake covers about ten acres and is supplied with water from an irrigation ditch. During the summer the water is constantly changing, and is therefore fresh and clean and very popular for swimming. There are frequently as many as 500 persons in the lake at one time on hot summer afternoons.

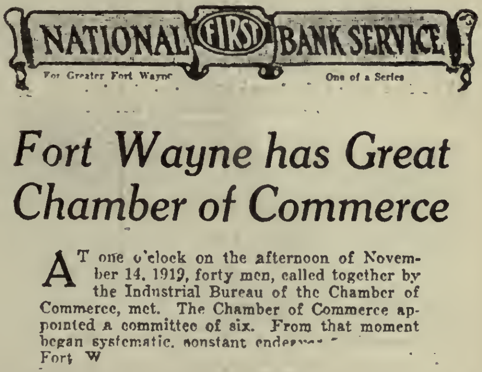
The tournaments are conducted under the auspices of the Commercial Club and are growing more successful each year. The swimming tournament has been held on Labor Day during the last two years, and on each of these occasions a community picnic was held in City Park at the same time, with an appropriate entertainment. The event drew a large crowd from both Larimer and the adjoining counties.

For both the swimming and skating tournaments, people interested in those sports have made use of the lake for practicing, and some very creditable exhibitions have been given. The Commercial Club offers prizes of merchandise which are donated by the local merchants. Money prizes are not given, in order to avoid the possibility of accusing any of the contestants of professionalism.

O. J. WATROUS,
Secretary, Fort Collins Commercial Club.

Unsolicited Endorsement

Fort Wayne, Ind.—Recognition of the work of the Fort Wayne Chamber of Commerce by the largest financial institution in northern Indiana came unsolicited recently in the form of an 11-inch, double-column paid advertisement which it inserted in the *Fort Wayne News and Sentinel*. The upper portion of the advertisement is reproduced below:



NATIONAL FIRST BANK SERVICE
For Greater Fort Wayne
One of a Series

Fort Wayne has Great Chamber of Commerce

At one o'clock on the afternoon of November 14, 1919, forty men, called together by the Industrial Bureau of the Chamber of Commerce, met. The Chamber of Commerce appointed a committee of six. From that moment began systematic, constant endea[illegible]
Fort W

The bank, in its advertisement, then went on to say that the Chamber of Commerce had made an exhaustive industrial survey of the city that was worth thousands of dollars. By means of this survey Fort Wayne presented its advantages to a great manufacturing company seeking a new location and was selected as the site for an extensive plant.

The bank continued by saying:

"The Chamber of Commerce did two

HIGHWAY TRAILER

EDGERTON
WISCONSIN

The Largest Trailer Plant in the World

Highway Trailers Solve Municipal Haulage Needs

The two-way side dump Highway Trailer with steel body, showing dumping action

Release of body lock automatically dumps load clear of wheels

Cost $200 to $600 Less Than Average Trailers

The exclusive advantages which distinguish Highway trailers are a much greater factor in the wide preference they enjoy in all sorts of transportation than even the big price saving they effect.

The steel body, two-way side dump trailer, with drop frame was specially designed for garbage and ash disposal. The release of a lock automatically pitches the load clear of the wheels, in the desired direction. One man easily returns the body to upright position.

This type is easily adjusted for horse or motor traction. It has met with special favor in municipal hauling problems, because of its handling ease and the varied uses to which it is adapted.

Write for Literature or a Demonstration

One Man Loads, Unloads and Drives

One of the fleet of Highway Trailers adopted by the City of Savannah for municipal disposal needs other remarkable things in rapid succession. It organized a million-dollar corporation to build 1,000 homes. It brought railroad presidents to Fort Wayne, resulting in the decision bound by contract to build a belt line railroad connecting all the railroads in the city."

The following editorial appearing in a previous issue of the *News and Sentinel* was next quoted:

"These achievements constitute a stupendous program of work, and altogether make up a greater record of performance than has ever been written in any era of the city's growth since the pioneers in Fort Wayne's progress began during the first half of the last century to bring in the railroads."

The fact that this endorsement came entirely unsolicited is the thing that pleases the members and officers of the Chamber who have been doing the "heavy work."

H. E. BODINE,
Secretary, Fort Wayne Chamber of Commerce.

Texas Women Win Out in War on H. C. L.

Dallas, Tex.—The vigorous campaign against the high cost of living waged by the Housewives' Chamber of Commerce of the State of Texas resulted in puncturing the inflated price balloon—at least in this section of the country—and bringing it to earth. This was accomplished by means of an educational campaign in economy and thrift, which reached over 500,000 women in the state; through the establishment of community stores and the encouragement of coöperative buying; through encouraging the merchants to hold 20 per cent discount sales; through advocating the "back to the farm" movement, the cultivation of home gardens, and other means too numerous to mention.

A Speakers' Bureau was organized which supplied lecturers to appear before groups of women and talk to them about food economy, advocate their coöperating with the Fair Price Commission, and familiarize them with the Government's plan to reduce the high cost of living. Cards which housewives were induced to sign pledging themselves to help reduce the high cost of living were used with great effect.

Dallas was the first city in the country to initiate such a movement, and Texas the first state to organize its women. As an outgrowth of the activities of the Texas Housewives' Chamber of Commerce, the movement became national and there came about the organization of the Texas Woman's Division H. C. L. Campaign, United States Department of Justice, of which the writer was made chairman.

In spite of the present general tendency of food prices to decline, as evidenced by the October report of the Department of Labor, they appear to be sufficiently high yet in some places to make it possible to use to advantage the methods employed by the Texas Housewives' Chamber of Commerce. The organization will be glad to supply printed matter and information to interested inquirers.

MRS. MYRON A. KESSNER,
President, Housewives' Chamber of Commerce of the State of Texas.

Commercial and Civic Interests Unified in Waterloo

Waterloo, Iowa.—The Greater Waterloo Association has brought about the successful culmination of its plans to unite the Chamber of Commerce and Waterloo Club, and the Waterloo Commercial Club, two rival commercial organizations, under one roof. The campaign was completed late in September, and the organizations will move into the new quarters as soon as they are ready.

The history of this campaign from its very beginning is interesting. Nearly a year ago the Chamber of Commerce and the Commercial Club were officially "joined together" under the name of the Greater Waterloo Association in a so-called "wedding" ceremony and banquet which was widely advertised at the time. These organizations continued to occupy their separate quarters on opposite sides of the river, however, until more adequate quarters became necessary. Very desirable rooms on the second and third floors of the Syndicate Building were available and could be altered to suit the purpose for $10,000. Accordingly, a referendum vote was taken of the original members of the two organizations to learn if they approved of the plan to discontinue the separate sets of quarters and consolidate them in the same office, and of the plan to raise the $10,000 alteration fund by popular subscription. The referendum was carried by a large majority in each organization, and the altera-

Five ton Federal sprinkler owned and operated by City of Beatrice, Nebraska.

Municipalities have the faculty of choosing and standardizing on only the best in mechanical equipment.

It is not a matter of surprise that the records made by Federals in the coal mines, the oil fields, in the busy city and in inter-city haulage should bring the Federal truck to the attention of the municipal officials in charge of the purchasing of supplies.

This is one reason why there are so many Federals serving the corporate needs of so many communities. Their economy of operation, while secondary to performance, is, however, a big item when considered over a long period of time.

Federals are built in one to five ton capacities.

The many opportunities for making money being grasped by Federal owners is interestingly told in "Traffic News" which will be mailed free on request.

FEDERAL MOTOR TRUCK COMPANY
34 FEDERAL STREET, DETROIT, MICHIGAN

Another
FEDERAL

tion fund pledged within the time limit.

Thus ends, it is hoped, the rivalry between the east and west sides, which has been a great handicap to the proper development of the community. The Cedar River divides the city almost equally into two parts. People had fallen into speaking of the city's interests as those of the east side and those of the west side. The inhabitants were referred to as east-siders or west-siders, and a feeling of aloofness from the other crept into each side. So much bitterness existed that some of the citizens were even glad to see the city lose an activity that chose the other side of town.

The rivalry grew to such proportions that traveling men who wished to sell goods to business men on the west side could not do business there unless they stopped at a west side hotel, and the same unwritten law controlled the selling business on the other side. The result was that two commercial organizations came into being, one on either side of the river and each struggling for its own section rather than for the city of Waterloo. And Waterloo lost thereby in the competition with other cities.

Men with the best interests of the city at heart talked the situation over and sought a means of uniting the city and having one common commercial and civic organization working for the entire city.

A committee from one club called upon the other to arrange a merger. After long negotiations came the wedding dinner, the marriage of Mistress Chamber of Commerce of the west side to Mr. Commercial Club of the east side. The result was the Greater Waterloo Association.

The Association has a supply of the literature used in the campaign conducted this fall which it will be glad to send to interested commercial organizations.

E. F. MACDONOUGH,
General Secretary, Greater Waterloo Association.

Prepare for National Thrift Week

The National Thrift Week Committee is planning to conduct its annual campaign of economic education during the week of January 17-23, 1921. This week begins annually on January 17, Benjamin Franklin's birthday, giving honor to the memory of our nation's leading apostle of thrift. Each day of the week is named as follows:

January 17, National Thrift Day, or Bank Day
January 18, Budget Day
January 19, National Life Insurance Day
January 20, Own Your Own Home Day
January 21, Make a Will Day
January 22, Pay Your Bills Promptly Day
January 23, Share with Others Day

It is logical that the National Thrift Week observance this time should fit into the 300th anniversary celebration of the Pilgrims' landing by bringing to our country's attention their creditable and outstanding characteristic—thrift.

National Thrift Week is part of a year-round economic program. Local Thrift Week committees are urged to include in their local budgets the annual salary of an effective expert in economics who will not only act as general director of the Thrift Week activities, but will also conserve the results of the week's emphasis by organizing and constantly promoting the interests of savings clubs. Thus it becomes more than a mere flash-in-the-pan kind of enterprise. It becomes a permanent force working in a community to help its citizens get a better attitude toward their money matters.

Further information regarding the movement may be obtained from the local Y. M. C. A., or from the National Thrift Week Committee, 347 Madison Avenue, New York City.

The great America for which we long is unattainable unless the individuality of communities becomes far more highly developed and becomes a common American phenomenon. For a century our growth has come through national expansion and the increase of the functions of the Federal Government. The growth of the future—at least of the immediate future—must be in quality and spiritual value. And that can come only through the concentrated, intensified striving of smaller groups. The field for special effort should now be the state, the city, the village—and each should be led to seek to excel in something peculiar to it. If ideals are developed locally, the national ones will come pretty near taking care of themselves.—*Louis D. Brandeis, in "The Survey."*

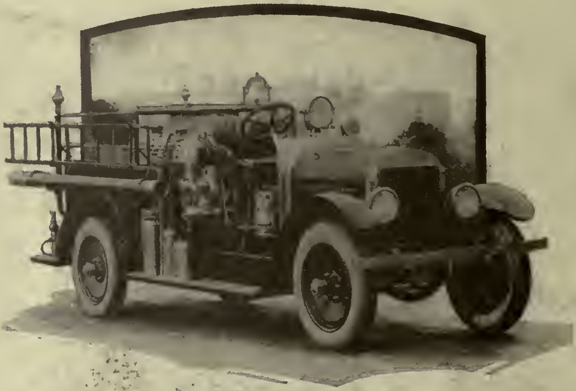
Standardized and
Engineered for
Fire Service only

STUTZ

Fire Apparatus

LEADS ALL OTHERS IN EFFICIENCY AND POWER

Built in all sizes and capacities



WHAT WE PROPOSE — WE DO
WHAT WE PROMISE — WE FULFILL

STRENGTH and STRUCTURE
SERVICE and SATISFACTION

If contemplating purchase of Fire Apparatus
GET IN TOUCH with the STUTZ

STUTZ FIRE ENGINE CO.
INDIANAPOLIS INDIANA

STUTZ
FIRE ENGINE CO.

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Local Motor Vehicle Regulations Valid If Not in Conflict With State Law

Local regulations of motor vehicle traffic are not invalid merely because they impose additional and more stringent limitations upon the traffic than does the state motor vehicle act, provided that these local regulations are not in conflict with the state law. It was so held by the California Court of Appeal recently in the case of Ham vs. Los Angeles County, 189 Pacific Reporter, 462. The Court quotes the following statement made by the Supreme Court of the state in another case as being analogous in its reasoning:

> "If the state should pass a law declaring it unlawful to erect a chimney of a height exceeding 150 feet, would any one seriously contend that a city of the state within the earthquake zone might not by ordinance, in the clear exercise of police power, for the benefit of its citizens, still further restrict the height of chimneys?"

So, it is held that a county ordinance prohibiting travel of motor vehicles over a bridge faster than five miles per hour is not invalidated by provision in a state law forbidding a greater speed than ten miles an hour.

Tax Levied at Special Meeting of Aldermen Held to Be Void

Statutes relating to municipal taxes will not be so construed as to prevent the municipality from realizing its necessary funds, but laws governing the exercising of the taxing power are construed liberally in favor of the taxpayer, and any provision intended to safeguard his rights or to insure a proper administration of the taxing powers should be treated as mandatory. So, a tax levied at a special meeting of the board of aldermen of a village instead of a regular meeting, as required by statute, is void. (Louisiana Supreme Court, Louisiana Western Railroad Company vs. Village of Duson, 83 Southern Reporter, 455.)

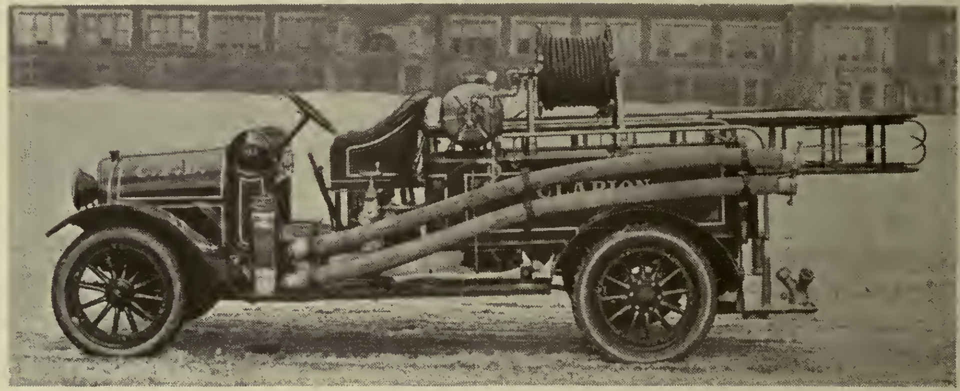
State Legislature Has Power to Require Municipality to Carry Out Government Projects

That a state legislature may not only limit the functions of municipalities, but may require the carrying out of projects constituting proper governmental functions, is shown by the decision of the Georgia Supreme Court in the case of McClatchey vs. City of Atlanta, 101 Southeastern Reporter, 682. It is held that it was proper for the Legislature to pass an act requiring defendant city to expend available revenues for the building of a cyclorama, museum, etc., and that citizens and taxpayers of the city can enforce compliance with the law by maintaining a mandamus proceeding against the municipal authorities charged with carrying out the provisions of the statute.

Voting on Alternative Propositions

The submission to the voters of a city of a proposition to issue bonds in a stated amount for the purpose of "leasing or purchasing" lands necessary for the construction of public utilities to be owned exclusively by the city, is not objectionable upon the ground that it is a double proposition. The approval of such a proposition by the tax-paying voters of the city confers upon the municipal authorities the right to either "lease or purchase" land for such purpose, which alternative is properly exercised by the passage of an ordinance providing for the issuance of bonds for the purpose of providing funds with which to "purchase lands" for the purpose of constructing such utilities. (Oklahoma Supreme Court, Bowen vs. Garber, 185 Pacific Reporter, 1095.)

Reliable Fire Protection



Reo-Northern Triple in Service in Clarion, Pa.

The Northern Rotary Pump

—driven by a 27.2 SAE horsepower motor, has delivered 345 gallons at 120 pounds net pump pressure drafting water. This test has been made at various times.

Northern capacities are reliable. They are covered by a liberal guarantee. And in most cases users have found that the actual capacity of a Northern exceeds the guarantee by a surprising margin.

Ask Your Truck Dealer

to quote you a price on one of their chasses, equipped with Northern Fire Apparatus.

Write Us

about Northern equipments, Northern Trailer-pumps, Chemical Engines, Hose Carts, Extinguishers and Supplies.

Northern Fire Apparatus Co.,

Minneapolis, Minn.

Measure of Damages for Breach of Water and Sewer Service Contracts

In an action for breach of a city's contract to extend its water-mains and sewers in streets adjoining plaintiff's lots, the measure of damages is the difference between the value of the lots without the sewerage and water and their value if those improvements had been put in. Where such a contract did not specify the time within which the extension should be made, a reasonable time for performance, depending on the situation of the parties, the subject-matter of the contract, and the attending circumstances, is implied. (North Carolina Supreme Court, Lambeth vs. City of Thomasville, 102 Southeastern Reporter, 775.)

Cost of Improvement of Passageway Used by Public Under Revokable License Cannot Be Assessed Against Property Benefited

A statute authorizing a city to improve a "street, alley or other public place" at the expense of property benefited does not authorize improvement of the passageway across private land which has been used by the public under a mere license revocable at the pleasure of the owner of the land, holds the Indiana Appellate Court in the case of Turner vs. Sievers, 126 Northeastern Reporter, 504. In this case the Court says:

> "It is well settled that the power to assess the cost of improvements against the real estate benefited thereby does not exist in the absence of a statute granting such power, and, when granted, the extent of the power is limited to that which the statute expressly confers. Such statutes are strictly construed in favor of the property owner, and in case of doubt as to the existence of such power the doubt is resolved against the municipality."

Advertising Signs within Limits of Public Highway Ruled to Be Obstructions

In an opinion rendered to a county board the Attorney General of Iowa holds that such boards have ample power to enforce removal of advertising signs placed within the limits of public highways. It seems that under the ruling an abutting property owner could not validly authorize maintenance of such signs in the highway, although there is a general principle that an abutter may make any use of the part of a street or other public way the soil of which is owned by him, subject to all proper use of the way for public travel, etc. The salient parts of the Attorney General's ruling follow:

> "A public highway from side to side, and end to end, belongs to the public, and the question is too well settled to be the subject of dispute. It has been repeatedly held that an obstruction need not entirely block traffic in order to be the subject of removal. It is classed as an obstruction if it is shown that it is an impediment or hindrance which tends to interfere with free passage along highways.
>
> "It might further be stated that no person has a right to appropriate a part of the highway to his own use by using it for the posting of signs or advertising matter. The highway belongs to the public and the public may protect its use of such premises by removing all obstructions placed therein."

Relief Denied Taxpayers in Their Suit to Enjoin Collection of Increased Fares

Contracts between a city and a street railway permitting an increase in fares as a war measure for a limited time, at the suggestion of national authorities, to avoid receivership, etc., were made for the public good, so that city taxpayers, not alleging any vested right or interest in the contracts, and not alleging that the ordinance was unreasonable or in bad faith, or that their taxes would be thereby increased, and not referring to any law forbidding city to modify contract, had no interest to sue to enjoin collection of increased fares. (Louisiana Supreme Court, Black vs. New Orleans Railway and Light Company, 82 Southern Reporter, 81.)

Where Ordinance Vacating Street Has Not Gone into Effect, Its Repeal Will Continue Street

Whatever may be the general effect of an ordinance repealing a former ordinance, to revive the status of affairs which existed before the former ordinance was passed, when an ordinance has been duly passed vacating a street and has gone into effect, a repeal of it would have no effect to reestablish the street so vacated. But if an ordinance is passed for the vacation of a street to take effect at a future time, either upon the fulfilling of a condition or the happening of any future event, or the arrival of a fixed time, on repeal of the ordinance before it has gone into effect under its terms the street will continue thereafter to be a street as before. (Pennsylvania Supreme Court, Born vs. City of Pittsburgh, 109 Atlantic Reporter, 614.)

Free Public Library Newark N. J.

CULVERTS

Round **Half-Round**

The increased production of the new factory of the Newport Culvert Company is carried to all corners of the United States by railroad, steamship, motor truck, etc. The round and half-round type of non-corrosive corrugated culvert will be found in cities, towns, counties, under streets and highways, and carrying drainage beneath railway tracks. Complete data on corrugated culverts will be found in our literature sent free on request.

Newport Culvert Co.

542 West 10th St. **Newport, Ky.**

Municipal and Civic Publications

THE CONSTRUCTION OF ROADS AND PAVEMENTS.

T. R. Agg, Professor of Highway Engineering, Iowa State College. Second Edition, revised and enlarged. McGraw-Hill Book Company, Inc. New York. 1920. x + 463 pages. Tables, diagrams and illustrations.

While primarily intended as a text-book for college courses in highway construction and maintenance, this well-known publication has met with the complete approval of all classes of officials interested in the proper development of highway systems and the design, construction and maintenance of all types of roads. The present edition aims to bring all information on this subject up to date, and has succeeded well even in this time of unsettled conditions in the paving field.

A DAY CONTINUATION SCHOOL AT WORK.

Papers by twelve contributors, edited by W. J. Wray, M.A., and R. W. Ferguson, B.Sc., A.R.C.S. Longmans, Green & Co., London. 212 pp. Illustrated.

This series of papers describes the actual experiences of two-day continuation schools in English cities. It includes a consideration of the general problems of such schools, both for boys and for girls, and specific discussion of the teaching of such subjects as literature, mathematics, arts and crafts, etc. One chapter is devoted to the employer's part in continuation school work.

VIRGINIA PUBLIC SCHOOLS.

Part 1. Educational Survey Series, Vol. VII. Virginia Educational Commission and Virginia Survey Staff. World Book Company, Yonkers-on-Hudson, N. Y. 400 pp. Illustrated.

This study covers problems of both the city and the rural schools of the state, a survey of actual conditions affecting teachers and pupils, white and colored. It includes chapters on such subjects as School Organizations, Buildings, Finances, etc. Detailed recommendations are proposed for the problems discovered. There are over one hundred pages of very valuable statistical data.

SCHOOL ADMINISTRATION AND SCHOOL REPORTS.

Paul H. Hanus, Professor of Education, Harvard University, Cambridge, Mass. Houghton Mifflin Company, Cambridge. 1920. 200 pp.

This book includes a number of different essays on schools and education. Among the subjects considered are: "Testing the Efficiency of the Public Schools"; "German Schools and American Education"; Measuring Progress in Learning Latin"; "The Harvard Graduate School of Education."

POLITICAL SYSTEMS IN TRANSITION.

Charles G. Fenwick, Professor of Political Science, Bryn Mawr College. The Century Company, New York. 1920. 322 pp.

The object of this volume is to trace the changes brought about by the World War in the political institutions of the great nations and particularly in those of the United States. The author makes comparisons and contrasts between autocracy and democracy when at war, and between the older democracies and the new republics recently sprung up in Europe.

TOWN PLANNING IN CANADA.

Journal of the Town Planning Institute of Canada. Vol. 1, Preliminary number. October 1, 1920. With list of the officers and members of the Town Planning Institute of Canada. (Apply to the Journal of the Town Planning Institute, Ottawa, Ont.)

THE SOCIAL CASE HISTORY.

Its Construction and Content. Ada Eliot Sheffield. Director, Boston Bureau of Illegitimacy. Russell Sage Foundation, New York. 1920. 227 pp.

A book especially designed to meet the needs of social workers. It considers the purpose of social case histories, and with an abundance of illustration shows how to prepare satisfactory case reports and histories.

INDUSTRIAL HOUSING.

Morris Knowles, Consulting Engineer, formerly Supervising Engineer of Camp Meade, Maryland, and Camp McClellan, Alabama; and Chief Engineer, Division of Housing, Emergency Fleet Corporation. McGraw-Hill, Inc., New York. 1920. 408 pp. Illustrated.

The volume includes not only a thorough discussion of industrial housing problems, but also detailed consideration of allied activities, such as town planning, street systems, development of utility services, and related engineering and construction features. Problems of sewerage and draining are handled in ample detail, and the chapters on recreational activities and town management are worthy of special remark.

THE DESIGN OF HIGHWAY BRIDGES OF STEEL, TIMBER AND CONCRETE.

Milo S. Ketchum, Professor of Civil Engineering, University of Pennsylvania.
Second Edition, rewritten, McGraw-Hill Book Company, Inc., New York City. 1920. XV + 548 pp. Diagrams, illustrations and tables.

An interesting and valuable revision of this well-known book. The revision is aimed chiefly to include the best data on live loads due to the extensive use of heavy motor trucks, tractors and traction engines, which have caused so much worry to engineers and highway bridge officials. The book is divided into four parts, the first covering the calculation of stresses in bridge trusses and bridge portals; the second part takes up the field of the design of steel and timber highway bridges; the third part covers the design of reinforced concrete highway bridges and foundations; and the fourth takes into consideration the details of bridge design, bridge contracting, cost estimates and construction.

HELPING MEN OWN FARMS.

Elwood Mead, Professor of Rural Institutions, University of California. The Macmillan Company. New York. 1920. 227 pp. Illustrated.

This volume is a practical discussion of government aid in land settlement. It includes a general discussion of land settlement problems both in this country and in Australia, together with a detailed account of the Durham State Land Settlement, in Butte County, California.

SPECULATION AND THE CHICAGO BOARD OF TRADE.

James E. Boyle, Ph.D., Extension Professor of Rural Economy, College of Agriculture, Cornell University. The Macmillan Company. New York. 1920. 277 pp.

A businesslike study of the Chicago Board of Trade, and of the general subject of speculation in grain.

AMERICANISM VS. BOLSHEVISM.

Ole Hanson, former Mayor of Seattle. Doubleday, Page & Co. New York. 1920. 299 pp. Illustrated.

PUMPING BY COMPRESSED AIR.

Edmund M. Ivens, Mem. A. S. M. E.
Second edition revised. John Wiley & Sons, Inc., New York City. 1920. VI + 266 pp. Illustrations, diagrams and tables.

This book is devoted to the compression, transmission and application of air, with special reference to the lifting and conveying of liquids in connection with the displacement and air lift. This second edition includes about 30 pages of text and 18 illustrations, together with several formulas and tables not found in the first edition. It covers the accepted theories, the practical limitations which prevent the theoretical results from being realized in practice, the commercial construction of compressed air apparatus and material, and illustrated designs which embody the proved economical advantages covered by the theories as nearly as practical limitations and construction will permit. It is an interesting and valuable publication for engineers faced with air-lift problems for sewage, etc.

Fig. 102. 5 Gallon Pump

BOWSER ESTABLISHED 1885 **Piston Type Pumps Insure SAFETY**

The public demands absolute safety in the storing and dispensing of inflammable liquids.

There is no possibility of breakage or spilling of gasoline with BOWSER piston type measuring pumps to endanger lives and property. In 35 years there has been no record of a fire or explosion caused by a BOWSER outfit.

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HOSE BOXES
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Builders of Water Service devices since 1853

PUBLIC HEALTH AND HYGIENE.

William H. Park, M.D., Director, Bureau of Laboratories, Department of Health, New York City, Editor, with 23 contributors. Lea & Febiger, Philadelphia. 1920. VI + 884 pp. 123 engravings.

This handbook for public health officials, physicians and medical students is the most ambitious publication of its kind. The 24 contributors, including Dr. Parks, are all recognized authorities in the field they discuss. While written primarily for the medical fraternity and the public health official, there is much of great value to the citizen interested in public health activities. The volume covers generally the subjects of disease and its prevention, disinfection, epidemiology, sanitary surveys, ventilation, housing, food, including meat, milk and other foods, soil bacteriology, water-supply and sewage disposal, plumbing, swimming-pool sanitation, personal and military hygiene, rural public health work, tropical, industrial and child hygiene, public health education, mental hygiene, the care and control of mental defectives, maritime quarantine and vital statistics.

The book is a veritable encyclopedia for the public health official.

SOCIAL PUBLICITY.

"Elements of a Social Publicity Program," by E. G. Routzahn, Russell Sage Foundation. 17 pp. 1920. (Apply to Department of Surveys and Exhibits, Russell Sage Foundation, 130 East 22d St., New York, N. Y.)

CLEVELAND'S GOLDEN STORY.

James Wallen, from data by Prof. William M. Gregory. William Taylor, Son & Co. 1920. 109 pp. Illustrated.

An account of the founding and development of Cleveland, with a description of the diversified activities of the city at the present time.

MOTION PICTURES.

Industrial motion pictures, produced and distributed by commercial and manufacturing companies, film companies and the Y. M. C. A. List selected and arranged alphabetically by industries by the National Board of Review. (Apply to the National Board of Review, 70 Fifth Ave., New York, N. Y.)

HEALTH EXHIBITS.

"The Health Show Comes to Town," by Evart G. Routzahn, Department of Surveys and Exhibits, Russell Sage Foundation. 30 pp. 1920. Illustrated. (Apply to Department of Surveys and Exhibits, Russell Sage Foundation, 130 22d St., New York, N. Y.)

CITY PLANNING.

"The Law of the City Plan," by Frank B. Williams, Counsel for the American City Consultants. Published by the National Municipal League as supplement to the National Municipal Review for October, 1920. (Apply to the National Municipal Review, North American Building, Philadelphia, Pa.)

The publications listed above are for sale by their publishers. Those listed below are understood to be free upon application.

SPECIFICATIONS FOR BRICK STREETS AND ROADS.

The specifications of the National Paving Brick Manufacturers' Association for city streets and country highways constructed of brick have been published in a 168-page pamphlet, which may be secured from the National Paving Brick Manufacturers Association, 830 Engineers' Building, Cleveland, Ohio, by any public official or engineer interested in brick road construction.

HEALTH ADMINISTRATION.

A Plan for a More Effective Federal and State Health Administration, by Frederick L. Hoffman, LL.D., Third Vice-President and Statistician of the Prudential Insurance Co. 87 pp. 1919. A consolidation of papers on various phases of public health, including an appendix on the use of national parks and healing waters for health and recreational purposes. (Apply to Frederick L. Hoffman, Prudential Building, Newark, N. J.)

DETENTION HOMES.

The Detention Home, an Interim Report on the Juvenile Court of Toronto. 14 pp. 1920. An account of the Detention Home of Toronto and the results of a questionnaire submitted to a number of large cities. (Apply to the Bureau of Municipal Research, 189½ Church St., Toronto Ont.)

LINCOLN HIGHWAY.

"An 'Ideal Section' on The Lincoln Highway." A tabulation, with summary and comments, of the replies received in response to the Lincoln Highway Association's Questionnaire regarding plans and specifications for an ideal section. (Apply to The Lincoln Highway Association, National Headquarters, Detroit, Mich.)

HOSE COUPLINGS.

"Standardization of Threads for Hose Couplings and Fittings." 22 pp. Illustrated. 1919. Prepared by the Committee on Fire Prevention and Engineering Standards, National Board of Fire Underwriters. (Apply to the committee, 76 William St., New York, N. Y.)

FRAMINGHAM HEALTH CAMP.

Framingham Monograph No. 7, General Series. The Children's Summer Camp, with Supplement on Home-Living Conditions. Issued by the Framingham Community Health and Tuberculosis Demonstration of the National Tuberculosis Association. May, 1920. 31 pp. Illustrated. A detailed account of the history and operations of the camp. (Apply to Donald B. Armstrong, M.D., Executive Officer, Community Health Station, Framingham, Mass.)

SNOW REMOVAL.

"Keep the Highways Open." 4 pp. Illustrated. (Apply to the National Automobile Chamber of Commerce, National Motor Truck Committee, Marlin-Rockwell Building, 366 Madison Ave., New York, N. Y.)

CONCRETE WORK IN WINTER.

"Concrete Construction in Cold Weather." 22 pp. Illustrated. 1920. (Apply to Portland Cement Association, 111 West Washington St., Chicago, Ill.)

RAIL TRANSPORTATION.

"Unification of Railroad Lines and Service in Cities." Report of a committee of the National Conference on City Planning. 4 pp. 1920. (Apply to the National Conference on City Planning, 60 State St., Boston, Mass.)

Municipal Reports

Baltimore, Md.—Annual Report of the Comptroller for the fiscal year ending Dec. 31, 1919. (Apply to Peter E. Tome, Comptroller, Baltimore, Md.)

Belleville, Ont.—Belleville, Ontario—a booklet of information on the city. (Apply to the Secretary, Chamber of Commerce, Belleville, Ont.)

Boston, Mass.—Annual Report of the Children's Institute Department for the year 1919-1920. (Apply to the Children's Institution Trustees, Boston, Mass.

Boston, Mass.—Annual report of the Assessing Department for the year 1919. (Apply to Edward T. Kelly, Chairman, Assessors of the City of Boston.)

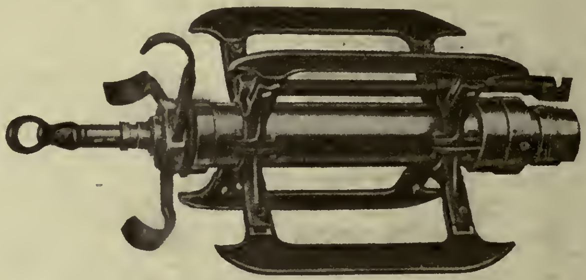
Brockton, Mass.—Suggested Form for Zoning Ordinance for Brockton, as recommended by the City Planning Board. Drawn by Arthur C. Comey, Consultant. (Apply to City Planning Board, Brockton, Mass.)

Chicago, Ill.—Report of the Zoological Gardens Committee, Forest Preserve District of Cook County. August 9, 1920. (Apply to Frank J. Wilson, Chairman.)

Hartford, Conn.—Sixtieth Annual Report of the Board of Park Commissioners and the Twelfth Annual Report of the Public Cemeteries for the year ending March 31, 1920. (Apply to Franklin G. Whitmore, Secretary.)

New Britain, Conn.—Sixty-Third Annual Report of the Board of Water Commissioners for the year ending March 31, 1920. (Apply to P. J. Egan, Clerk.)

Portland, Me.—Annual Report of the Park Commission for 1919. 23 pp. Illustrated. (Apply to Isaac F. Clark, Secretary, Park Commission, Portland, Me.)



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This sewer cleaner has won out in every test, even under extremely difficult conditions in scores of cities.

It thoroughly removes all obstructions and is operated either by sewer rods or cable. Three horse-power developed at the cutters with 60 pounds water pressure.

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Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Holt Sells Fifty Tractors to New York City

The Holt Manufacturing Company, Peoria, Ill., has been awarded the order for fifty 5-ton tractors for snow removal in New York City. These tractors are to be used by the Department of Street Cleaning in clearing snow from the streets in the congested districts of lower Manhattan, and the project marks a novel and distinctive advance in heavy tractor usage. A large number of smaller tractors have been purchased for secondary operation, but the 5-ton "Caterpillar," although higher in price than other heavy tractors offered for the work, was selected after the rigid test conducted by the city last July.

While the use of trucks equipped with pusher-plows for snow removal is quite general, the results have not been entirely satisfactory because of a lack of traction in snow and ice; hence the entry of the tractors into the field. The "Caterpillars" will be fitted with all necessary protection for drivers and are so equipped that no damage will be done to the streets by the treads. They are capable of operating constantly no matter how low the temperature. The tractor which climbed Pike's Peak last year—the first and only make of tractor to perform this feat—and which bucked heavy snow-drifts on solitary roads where any accident would have been fatal, is the same 5-ton "Caterpillar" selected by the city engineers of New York to prevent a recurrence of last winter's traffic blockade and fire danger.

Underground Park Cables

The extensive use of electricity requires that the distribution system shall be inexpensive. In America this condition has been attained by the use of aerial conductors supported on insulators. These aerial conductors are either bare, or covered with an impregnated insulating braid of saturated cotton; in the latter case they are known as "weatherproof wires." Construction of this type is permissible if the density of population is low. In large cities it is necessary to put cables underground, and in order to allow for future growth, the cables are laid in ducts, a sufficient number of which are provided to allow for the installation of many more cables than originally required.

In Europe, aerial lines have met with little favor because distribution systems run through some densely populated districts where the unsafety of aerial wires affects the average European more than the average American. Underground distribution systems have, therefore, been standard in Europe. European cities, in general, do not grow with the rapidity of American cities, and it is unnecessary to make provision for such extensive growth of

TYPE OF 5-TON TRACTOR TO BE USED BY NEW YORK CITY IN SNOW REMOVAL THIS WINTER

Estimates of Cost of Proposed Work
Reports on New Improvements
Preparation of Plans
Supervision of Construction

Dams and Reservoirs
Pipe Lines
Filtration Plants
New Water Supply Systems

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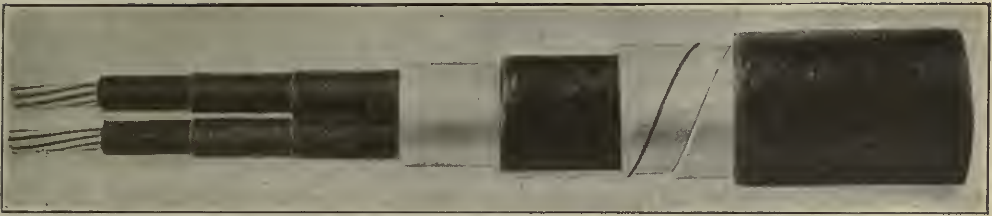


TYPE OF TWO-CONDUCTOR PARK CABLE FOR UNDERGROUND SERVICE

electric distribution systems. The Europeans have therefore buried their cables in the ground, instead of putting them in ducts, except in great centers of population, where the duct system is required.

Two systems of underground cables laid directly in the ground are used in Europe. In one, the cable is laid in a trough of bituminous compound which protects it from the elements; in the other, the cable is armored with a galvanized steel tape. The latter construction was introduced into this country for distribution systems in public parks, and has therefore become known as park cable. This type of cable was found suitable for distribution systems on streets with ornamental lighting, such as the "white ways" of many American cities. The use of park cable enables these streets to be illuminated without disfiguring overhead lines. It was then found that park cable was suitable for connecting the various buildings on large estates where overhead lines would be unsightly, and ducts unnecessarily expensive.

The European practice of using park cable for general distribution is beginning to find favor in America. Where cables are installed in duct systems, the distribution of heat is a serious problem, as the current-carrying capacity of a cable depends upon its ability to get rid of the heat generated in it. Park cables, being buried directly in the earth, will carry more current than cables in ducts, because the ducts have heat-insulating qualities. It is therefore often more economical, in the long run, to install a park cable of sufficient size to take care of future loads instead of installing a smaller cable in a duct and providing sufficient ducts to care for future loads.

The usual type of construction for park cable as made by the Habirshaw Electric Cable Company, Inc., Yonkers, N. Y., is as follows:

The number of conductors is from one to three, ranging in size from No. 14 to No. 4/0 A.W.G., although larger sizes are sometimes made. Rubber insulation is most commonly used. In the case of a 3-conductor cable, jute fillers are used to make the cable round. The core is covered with a lead sheath, over which there is a covering of asphalt jute, and two flexible galvanized steel tapes applied so that the top tape overlaps the spaces between the turns of the inner tape; and finally, over all, there is a covering of asphalted jute.

The outer layer of asphalted jute is intended to protect the steel tapes from injury. The inner layer is to protect the sheath from injury by the tapes. Splices can be protected in the following ways: by burying them at a slightly greater depth than the rest of the cable; by building small trenches around them; or by using a junction box filled with insulating compound. Where park cables are likely to be injured, they can be protected by placing a line of creosoted boards in the ground over the cable, or by placing small stones over the cable before replacing the earth. The usual depth for installing park cables is from 18 to 24 inches, although there are some installations at a depth of 12 inches.

Park cable has other uses outside of those mentioned above. It is used for connecting houses to garages, for railroad signals and yard lighting, lighting the grounds of industrial plants, lighting parks, and crossing under small lakes and streams.

Exhibit of Well Pump

One of the many interesting exhibits displayed at the convention of the American Society for Municipal Improvements, held in St. Louis during the week of October 15, consisted of a working model of a Pomona double-stroke deep-well power pump, manufactured by the United Iron Works, Kansas City, Mo., and demonstrated by A. L. Abbott, Manager Pump Sales Department. This model was mounted over a water tank, and the working barrel or cylinder was made of glass, illumi-

A NON-PULSATING DEEP-WELL PUMP

A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

Missoula, Montana, is one progressive western city utilizing "ELRECO" Combination Railway and Lighting Poles, which makes separate Lamp Standards unnecessary.

The "ELRECO" Steel Poles support ornamental lighting brackets with modern General Electric Lighting units; also, the span and service wires of the Railway and Lighting Company; keep the streets free and unobstructed from extra Lamp Standards, wooden poles, and a multiplicity of wires, etc.

The usual practice of financing such an installation is to divide the cost between the local Street Railway and Lighting Company, Merchants and the City, making the cost of "WHITE WAY" very reasonable.

What other progressive cities have accomplished is well illustrated in our handsome Catalog "F", sent on request to those interested.

Electric Railway Equipment Company

CINCINNATI, OHIO.

New York Office—30 Church Street

nated by a system of colored lights so that the action of the valves and plungers could be plainly seen, working inside the glass cylinder. The model showed how the overlapping stroke was obtained, which results in a continuous flow of water. The discharge from the pump was allowed to flow over a small weir, the water being pumped into the weir and then allowed to overflow back into the tank. The model was driven by an electric motor and was in continuous operation throughout the convention.

The Pomona pump has a number of points of merit, and the manufacturers claim that it is unequaled in the combined features of reliability, durability and economy. Two of its special advantages are the extra long stroke and the continuous flow of the discharge. These pumps are built in a large variety of sizes, there being a size that will fit almost every municipal or public service pumping plant where water is obtained from deep or shallow wells. The pumps are designed to be driven with any kind of power, and will raise water from a well and deliver directly against city pressure or into an elevated tank.

A Warning Sign Against Truck-Overloading

A method of coöperation with operators of trucks to aid them in holding down maintenance is a recent idea of the Firestone Tire and Rubber Company, of Akron, Ohio. This company is sending to all truck manufacturers who equip their output with Firestone tires, a stock of hand-etched zinc plates, 2 x 5 inches in size, which contain a warning against overloading of trucks. The warning may be tacked to the cowl of each truck before it leaves the factory. It is in the form of a simple table showing the carrying capacity of pneumatic (cord) tires of various sizes and the proper inflation for each size. The figures are based on computations made by the Society of Automotive Engineers. At either end of the warning plates is an attractive "Ship by Truck" symbol.

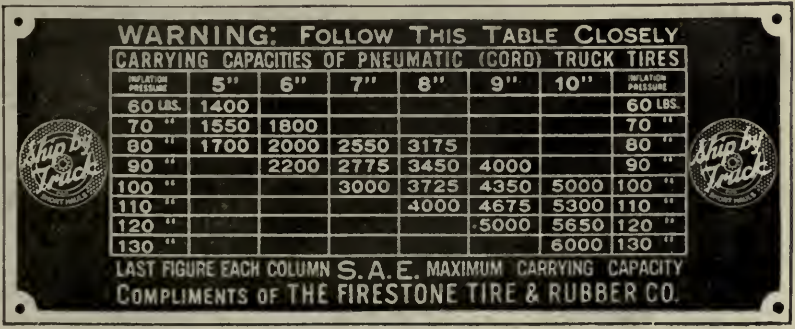
The Firestone Company also furnishes a pamphlet with complete instructions for the application of giant cord tires and demountable rims. A copy of the pamphlet is to be placed in the tool box of each truck as it leaves the factory.

IT HOLDS THE METER FIRM

A Meter Coupling Yoke

In order to be satisfactory, a meter coupling yoke must assure rigidity of the meter inlet and outlet pipes, whether the meter is in service or not, and it must eliminate all strains upon the meter with its consequent leaks and provide ample opportunity for expansion and contraction without damage. A meter coupling yoke of this type is manufactured by the H. W. Clark Company, Mattoon, Ill.

The yoke is constructed of heavy gray iron castings fitted with bronze, in such a manner as to withstand the most severe strains. Waterways are tested to 300 pounds working pressure, and the wheel handle furnishes easy operation. The waterways are large, providing a much greater area than the ¾-inch supply pipe, thus more than offsetting the frictional losses of bends and insuring maximum deliveries. This yoke is adapated to ⅝, ⅝ x ¾, and ¾-inch meters of every manufacture. It is furnished in 1-inch size for meter box installation only. All parts of the basement coupling are interchangeable, thus reducing the stock necessary in the water-works storehouse. The yoke can be readily sealed with the ordinary wire seals when desired, and no unions are required in connecting up with the supply pipe.


Ship by Truck
Ship by Truck

WARNING: FOLLOW THIS TABLE CLOSELY

CARRYING CAPACITIES OF PNEUMATIC (CORD) TRUCK TIRES

INFLATION PRESSURE	5"	6"	7"	8"	9"	10"	INFLATION PRESSURE
60 LBS.	1400						60 LBS.
70 "	1550	1800					70 "
80 "	1700	2000	2550	3175			80 "
90 "		2200	2775	3450	4000		90 "
100 "			3000	3725	4350	5000	100 "
110 "				4000	4675	5300	110 "
120 "					5000	5650	120 "
130 "						6000	130 "

LAST FIGURE EACH COLUMN S. A. E. MAXIMUM CARRYING CAPACITY

COMPLIMENTS OF THE FIRESTONE TIRE & RUBBER CO.

King Lighting & Trolley Pole

We are prepared to furnish complete combination lighting & trolley pole equipment including brackets & Novalux units

To those interested in modern & economical street lighting, we will send our illustrated booklet Send your name and address.

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LAID ON BITUMINOUS CONCRETE BASE

THE PROOF OF THE PUDDING

Sawed Section of Warrenite-Bitulithic Pavement Laid on Camp Lewis Roads—1½-In. Wearing Surface and 2½ In. Foundation

Warrenite-Bitulithic City Pavements and Country Roads have been laid on bituminous concrete base so very extensively during the past ten years as to prove beyond a doubt its efficiency and superiority under all conditions of climate and traffic.

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Ash and Garbage Cans for Municipal Service

Important pieces of equipment in connection with municipal buildings, at this time of the year particularly, are ash and garbage cans—galvanized cans not only made from heavy-gauge metal but designed with a view to withstanding the rough usage to which equipment of this kind is subjected. Illustrated below is a type of heavy reinforced can commonly called the Engineers' Can, made by the Rochester Can Company, Rochester, N. Y., which has met with unusual favor, and which is generally conceded to be the last word in durability. These cans are made from 16-gauge steel, either black or galvanized, reinforced both top and bottom with heavy shaped iron bands securely riveted in place, and equipped with either stiff or drop type handles. As the name implies, these cans are designed primarily for use in engine rooms, in fact, wherever an exceptionally strong and durable can is demanded.

A CORRUGATED GARBAGE CAN WITH BAIL HANDLE

There is, of course, a wide variety of styles and sizes in the lighter-gauge ash cans. A few of the more popular ones are shown below. Garbage cans in the flaring style, that is with tapering sides which allow them to be shipped and stored nested, economizing both in space and shipping charges, seem to be the most popular. These cans are made either plain or corrugated, the corrugations adding materially to the strength and rigidity of the can, and at only a nominal increase in the initial charge.

TWO TYPES OF ASH CAN (ABOVE)

CORRUGATED ASH CAN AND COVERED GARBAGE CAN

Fairbanks-Morse Acquires Luster Business

Fairbanks, Morse & Company, Chicago, Ill., has purchased the entire business, consisting of all stock on hand, good-will and liabilities, of the Luster Machine Shop and Railway Equipment Company, 917 Arch Street, Philadelphia. Fairbanks-Morse has opened a new branch at this address under the management of D. W. Dunn, and will sell their complete line of engines, motors, pumps, etc. The entire personnel of the Luster Machinery Company has been retained. E. J. Luster, former president, will be manager of the Machine Tool Division of the Fairbanks-Morse Philadelphia branch.

Rector with Pease Laboratories

Thomas M. Rector, formerly in charge of the Division of Food Technology of the Institute of Industrial Research, Washington, D. C., has been appointed Director of the Department of Industrial Chemistry of the Pease Laboratories, Inc., 39 West 38th Street, New York City. Mr. Rector has been associated in the commercial development of several nationally known products. During the war he served as an officer in the Chemical Warfare Service and was active in the perfection of the American gas mask.

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"Proven by the test of time"

Insulated Wire & Cable

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Habirshaw Power Cables—Rubber—Paper and Varnished Cambric—Sector and Concentric

Simplex Hard Service Cable

FOR PORTABLE TOOLS AND LIGHTS

Flexible as a lamp cord. Protected by a seine twine braid specially treated to withstand rough use. Recommended for portable tools and lights in machine shops, garages, shipyards and on any engineering or construction work where conditions are severe and continuous service is essential.

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